NOVEMBER
1952

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# CHEMICAL PROCESSING

## Highlights of This Issue

**Vegetable seeds with 10 to 65% oil content suitable for versatile solvent extractor . 6**

**Silicone resins useful in heat-stable and weather-resistant coatings . . . . . 18**

**20-ton-per-day sulfur recovery plant operating at profit in Texas . . . . . 42**

**Paper mill dodged problem of chipping out 20,000 bricks to find corroded areas . . . . . 58**

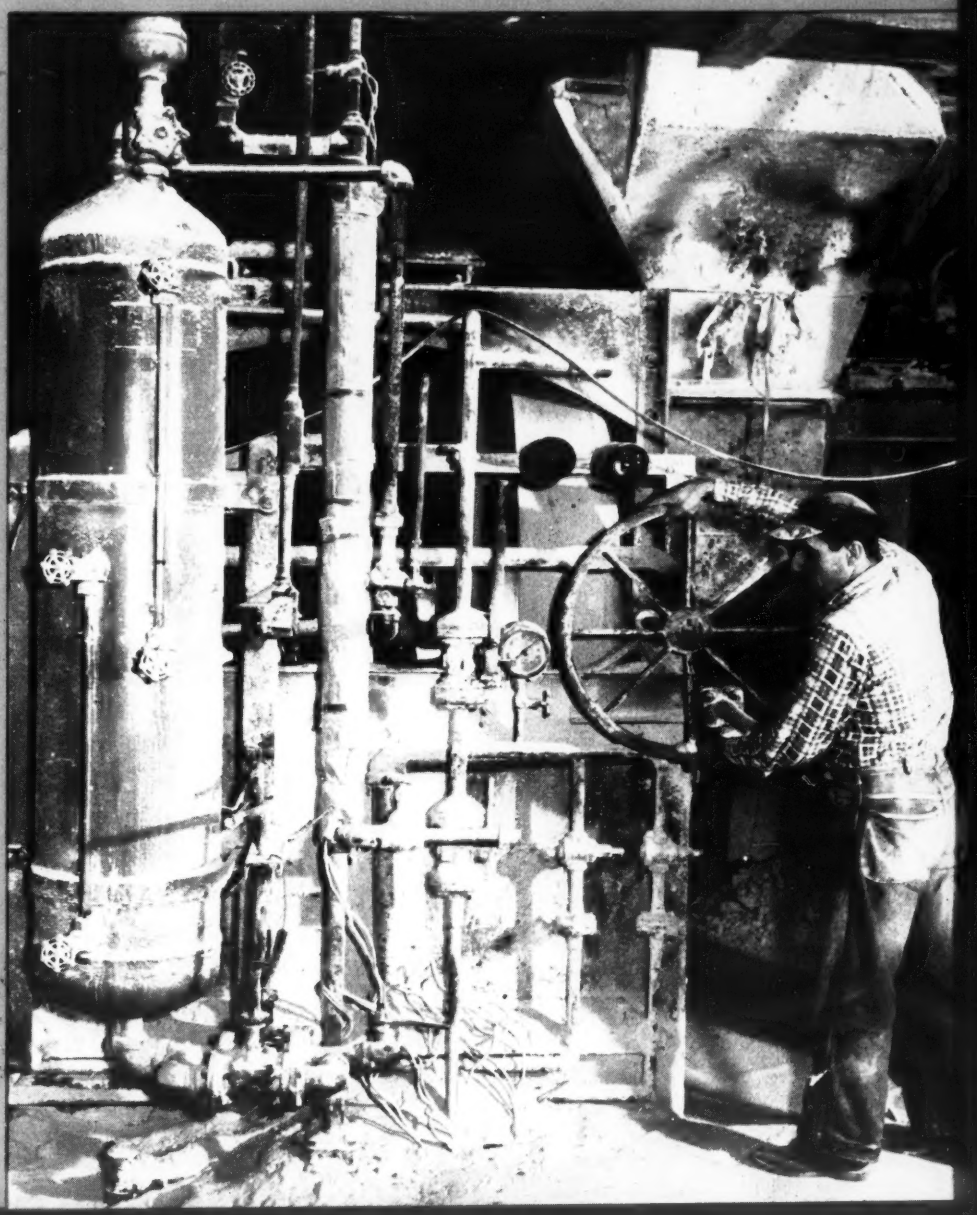
**Bags, boxes nestle securely in king size sling for pick-up by fork truck . . . . . 88**

**Liquid-mixing laboratory minimizes guesswork in design of commercial installations . 108**

**Eliminates explosion hazards of dusts and fine particles 122**

**Plastic-base compound protects against common causes of joint failure . . . . . 138**

*(Continued on page 4)*



## The Cover Picture

Blender incorporates surface active agent into mixed fertilizers at Illinois Farm Supply Company. Use of conditioner results in uniform, free-flowing product. See article on page 36

PUTMAN PUBLISHING CO., CHICAGO

**Creators of PUTMAN-STYLE Magazines** . . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more READER ACTION

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The Chem-O-Feeder is being widely used in the production of foam rubber, the chemical preparation of metal surfaces prior to spray painting, the handling of filter aid slurries in oil recovery operations, and the feeding of dyes in the textile industry. This versatile feeder also has applications in many other industries where difficult, small quantity feeding and proportioning problems are encountered.



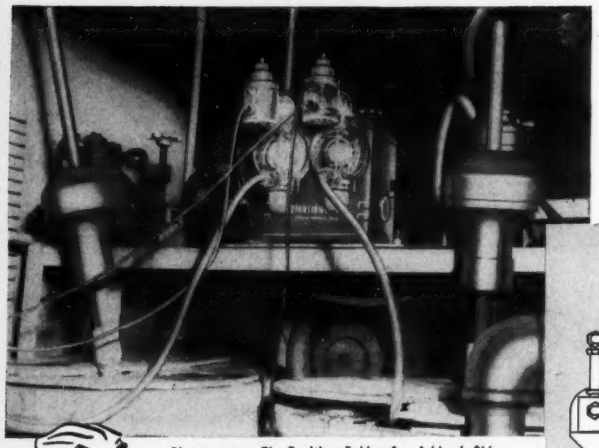
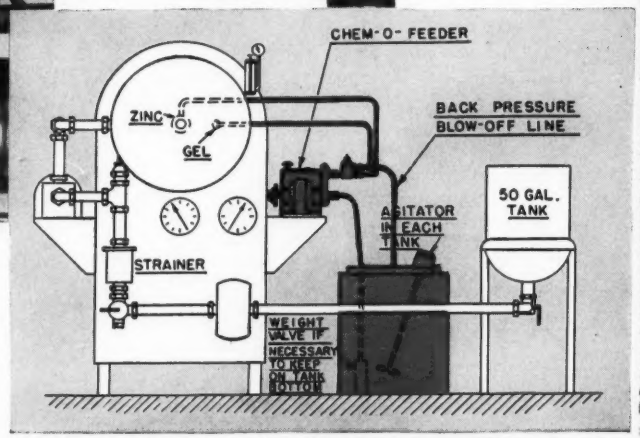


Photo courtesy The Faultless Rubber Co., Ashland, Ohio.




Installation of Model 2-47 Chem-O-Feeder for foam rubber production.



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## "That's Interesting"

### Plant life's catalyst

Infinitesimal quantities of the antibiotic terramycin cause significant stimulation in the growth of sweet corn and other plants, according to Dr. Louis G. Nickell, Chas. Pfizer & Co., Inc., Brooklyn, N. Y. Experiments revealed that growth responses occurred when plants were given certain antibiotics in concentrations as low as one part antibiotic per million parts water.

Average height of corn given terramycin was 17.45 inches, compared with 14 inches for untreated corn. Treated corn weighed 45 grams wet, while untreated corn weighed 23 grams: after drying, treated group weighed 5.1 grams as contrasted to 2.4 grams of untreated corn. Upon this and other factors, Dr. Nickell concludes that gains represented were true growth responses, not merely increased water absorption.

### Labeling requirements

"Read the Label" is a brief report covering the federal labeling requirements for food, drugs, devices, and cosmetics. "The label must not be false or misleading in any particular," the booklet states, "and it must be easy to read and understand under ordinary conditions of purchase and use. Flashlight and magnifying glass are not required shopping equipment." Copies may be obtained for 15¢ from the U. S. Government Printing Office, Washington 25, D.C.

### Layer-cake parking of autos

Four cars parked in area formerly occupied by one is project of Evans Enterprises Inc., Massillon, Ohio, who have devised a system of four-layer parking using a lift truck. Cars are picked up by special platform on truck and stored in plywood cubicle. Garage which accommodates this layered parking looks like an upended egg carton.

### Fire preventative coating

Upright wood surfaces may have positive fire protection when brushed or sprayed with coating listed in the *Oakite News*. Extreme heat causes coating to release gases which smother fire around upright.

### Ice that won't melt

Reusable ice that doesn't melt is novel shipping aid reported in *U. S. I. Chemical News*. Temperature of material can be varied from −8° to 32°F. Unusual characteristic of ice is that it will not freeze flowers, but it will freeze water and harden ice cream. Material can be refrozen and thawed without shrinkage or deterioration.

For more information on product at left, specify CP 5857 . . . see information request blank between pages 2-3.

## Common Sense About Chemicals in Our Food

This editorial has been written at the request of the editors of CHEMICAL PROCESSING . . . and is authored by

**MR. A. D. HYDE**
Vice President in charge of Research, General Mills, Inc.



Was born in Pipestone, Minn., in 1902. Attended U. of Michigan, U. of Illinois, and Columbia University: received B.A., B.S., and metallurgical engineering degrees. Served as research engineer for the Metals Disintegrating Co., Elizabeth, N.J., during 1927.

Mr. Hyde joined General Mills as trainee in 1928 and worked as draftsman, oiler, machine tender, grinder, second miller, head miller, and finally milling superintendent. From 1931 to 1942, he served in Manufacturing Department handling labor relations for General Mills during the days of NRA. Became director of all General Mills' manufacturing activities in 1935. While in this position, he guided the development of a small, experimental machine shop into the company's Mechanical Division, which later won four Army-Navy "E" awards.

In 1942 he was named vice president of the company in charge of Research; and on October 1, 1952, Mr. Hyde was appointed to the Board of Directors. He administrates all of the company's non-food operations, which include the Chemical, Mechanical, and Special Commodities Divisions. He continues to supervise research activities.

IF someone suddenly told you your food was poisoned, you probably wouldn't believe him. Yet that, in effect, is what a few people are now trying to tell you and 150 million other Americans. With lurid language, they are spinning tales of "sinister chemicals," lurking in food to turn your meals into mayhem. Generally these blasts spring from an honest concern for the nation's health and welfare. Many of them are based on Congressional hearings. Part of the impression comes from the word chemical, itself, which has somehow acquired a cloak and dagger reputation: it seems to suggest something foreign and dangerous.

Actually, of course, foods are chemicals. For the most part they are composed of carbon, hydrogen, oxygen, and nitrogen. When people talk about chemicals in foods, however, they usually mean substances added to natural food either intentionally or unintentionally. Occasionally they refer to materials made synthetically as compared with those taken in their natural form from plants and animals.

Today, the food industry uses many chemicals solely for their functional value — to preserve and/or add to the nutritive quality of the food. Small amounts of anti-

(*Continued on page* 207)

**CORRECTION NOTICE**

*The Guest Editorial for our October,* 1952 *issue was reported from an address by Mr. John C. Garrels, Jr., before the Manufacturing Conference of the American Management Assn. at the Hotel Statler, New York, on April* 8, 1952.




When inquiring check CP 5858 on handy form, pgs. 2-3



## *industrial revolution — part 2*

If you're a typical reader of CHEMICAL PROCESSING and interested in instruments, you've probably noticed what's been happening lately. We've certainly arrived at the day where instruments are not luxuries or afterthoughts of process design — they're now fundamental parts of chemical process work.

But there's more to it than that. Some time around the beginning of the war we heard about "electronic brains." It may be significant that the average engineering student can now tell you about analog and digital computers and their relative merits.

Of course, an engineering student interested in astronomy could tell you about conditions on Jupiter — and that has nothing to do with chemical processing. But beside an intellectual interest in "machines that think" all of us connected with chemical industry are interested in computers and "brains" because they are a type of process improvement.

You can hardly doubt that there is an interest in computers as industrial tools. And they're not industrial tools of the year 2000 AD either . . . at least the digitals, analogs, plotters, and computing controllers we saw at the Instrument Show in Cleveland last September looked like they meant business.

Plenty of these computers *are* working in industry now. Most of them, probably, in big refineries; some in small plants. If you don't hear much about them it may be that they're a good thing. . . . good enough to keep quiet about.

We've all heard about the "automatic factory." In fact, that term has been used to describe operations where automatic controls have been used or automatic machinery does the bulk of the work. What about a process where final *quality of product* is measured and used by instruments to set up operating conditions? *That* factory is on its way, if not already in operation someplace.

And that's why this increased tempo and interest in instruments really is a new phase or second part of the industrial revolution. We've found better muscles starting with Watt's steam engine. Now we've reached the stage where better senses, better reflexes, perhaps better brains are supplanting human efforts.

You've gathered that I enjoy reporting news of developments in instruments to you. There is a sort of super interest in these developments, an importance beyond the immediate. Instruments are solving immediate problems in droves. We can only wonder about the problem they're raising — the problem that parallels the period when we stopped doing heavy labor ourselves and learned to build steam engines.

Bruce Fader

### *editorial highlights*


Primer provides answer to corrosion control in sodium hypochlorite plant 10

80 ppm of experimental fungicide gives over 90% control of blight of apple and tomato 30

Maintenance of heated vessels is simplified by snap-on insulated jackets 44

Portable device to test presence of explosive vapors 68

Redesign of moisture tester fits Karl Fischer method to still more uses 76

Pocket size hardness tester has only two moving parts for simple operation 84

Simple grid structure of tray ups still capacity, cuts costs 114

Looks at labels with electric eye to make certain that medicines are correctly marked 118

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Blast-action cleaner eliminates dangers and fire hazards of heavy duty cleaning 178


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1. When you want more information on processes, controls or developments of products discussed in this issue, see Reader Service slip opposite page 2

2. If you are looking for information on specific products, use the Product Directory "Quicklocator" for all types of materials, instruments, processing equipment, etc. This Product Directory lists everything in this issue, with page references ..... 210

3. If you want to subscribe to this magazine, see reader-qualification form opposite page .. 3

# CHEMICAL PROCESSING

(CHEMICAL PROCESSING PREVIEW)

*For MEN WHO MANAGE — The News Magazine of Developments*

Vol. 15 NOVEMBER, 1952 No. 11



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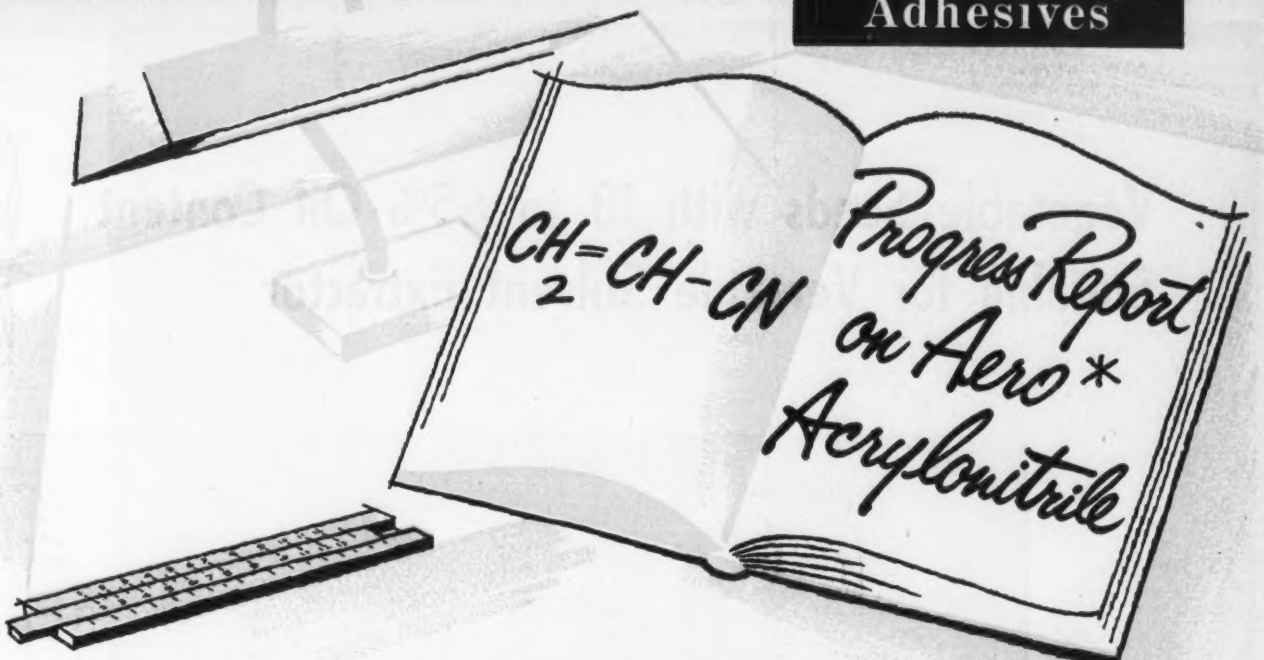


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During the last two decades, the adhesive industry has experienced a steady increase in the use of synthetic resins. Today most of the permanent-type commercial bonding agents are formulated from these resins.

AERO* Acrylonitrile is finding increasing use both directly and indirectly in the preparation of the three major types of such synthetic adhesives: *thermosetting, thermoplastic, and elastomer.*

*Thermosetting resin adhesives* consist generally of polymers of formaldehyde with phenol, resorcinol, furfural, urea, and melamine.

However, a recent patent describes a new formulation based on acrylonitrile. This resin acts as a self-bonding agent for mica, and in addition will cement mica to metal and glass.

*Thermoplastic resin adhesives* employ acrylonitrile as a raw material in the production of polymers of acrylate esters, copolymers of methacrylate-acrylate esters, and hydrolyzed polyacrylonitrile.

American Cyanamid's Acrylic Polymer 201 should be considered for many of the same general uses that have been found for methyl cellulose, hydroxyethyl cellulose, polyvinyl alcohol, and other water soluble adhesives. Other applications—ceramics, leather, textiles, coating paper, and detergents.

With ester resins—principally those from ethyl acrylate—strong, flexible, and chemically resistant bonds are obtained with glass, leather, textiles and paper. These adhesives are impervious to fungus attack and are water and cold resistant. They also can produce transparent films of high permanent tack, ideal for pressure sensitive tapes.

*Elastomer type adhesives* include both natural and synthetic rubbers and rubber copolymers compatible with synthetic resins. AERO Acrylonitrile also finds use as an essential ingredient of the important nitrile type synthetic rubber.

Bonds obtained with the nitrile elastomer type adhesives whether applied by solvent release, heat fusion, or vulcanization, are water, heat, and cold resistant, and possess excellent resistance to solvents and fungi. These resins are used commercially with wood, rubber, glass, leather and paper. They give particularly strong adhesion with metals and textiles. They are used to prepare oil resistant cements and can be combined with phenol and resorcinol resins resulting in a cement that possesses the cured adhesive strength of the resin and the flexibility of the rubber. Such cements are widely used in the shoe and automobile industry. They can bond together metals, plastics, rubber, fabrics, leather, glass fiber, nylon, or wood and resin coated materials.


***To obtain more detailed information about AERO Acrylonitrile and its application in the manufacture of adhesives use the attached coupon.***




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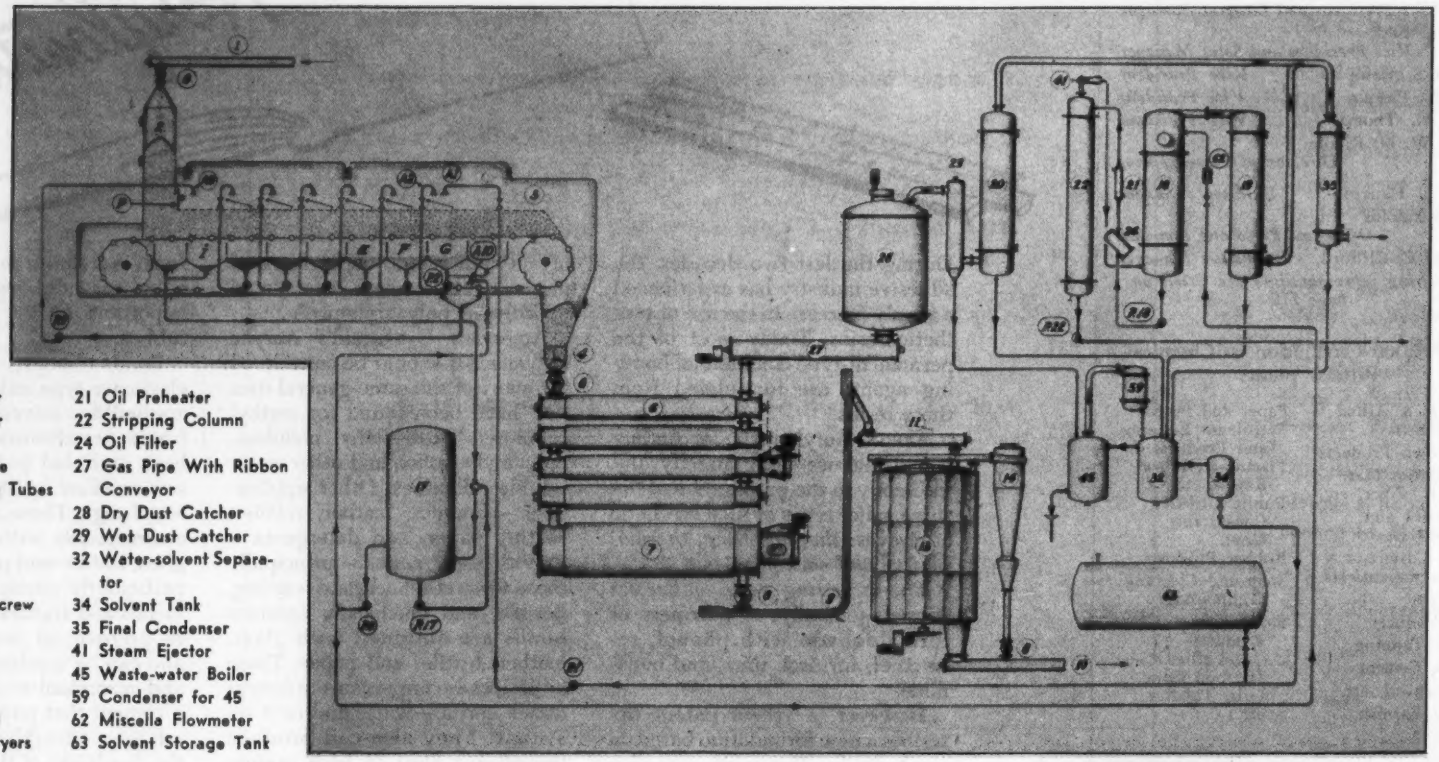
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# Vegetable Seeds with 10 to 65% Oil Content Suitable for Versatile Solvent Extractor

**Fines present no problem because they are filtered on moving seed bed; oil content of extracted meal always less than 0.7%**



Flowsheet of De Smet system of solvent extraction of vegetable oils and fats

1 Intake Conveyor
2 Feeding Hopper
3 Extractor
4 Discharge Device
6 Jacketed Drying Tubes
7 Finisher Dryer
8 Rotary Valve
9 Conveyor
10 Conveyor
11 Humidification Screw
13 Meal Cooler
14 Cyclone
17 Miscella Tank
18 Evaporator
19 Condenser for 18
20 Condenser for Dryers
21 Oil Preheater
22 Stripping Column
24 Oil Filter
27 Gas Pipe With Ribbon Conveyor
28 Dry Dust Catcher
29 Wet Dust Catcher
32 Water-solvent Separator
34 Solvent Tank
35 Final Condenser
41 Steam Ejector
45 Waste-water Boiler
59 Condenser for 45
62 Miscella Flowmeter
63 Solvent Storage Tank

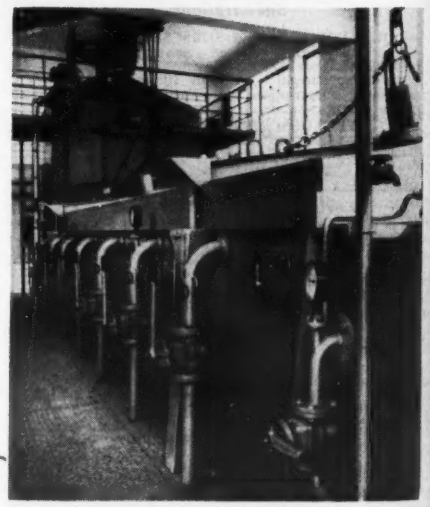
MANY years before solvent extraction of vegetable oil was introduced in the United States, it had been reduced to a general operating practice in Europe. One of the European systems of extraction, time-tested on a wide variety of commercial oils ranging from unpressed cottonseed and soybean to copra and palm kernel oil, is the De Smet system.

Operating under normal conditions, the process delivers a meal with a maximum oil content of 0.2 to 0.7% and a moisture content of 4 to 6%. A special type of meal conditioning unit delivers extracted meal with a moisture content adjustable to any figure up to 12% and at a temperature suitable for bagging. Solvent content of the meal and the extracted oil runs less than 0.1%. Solvent loss is less than 0.4% of the weight of the incoming prepared seed. Steam consumption is generally lower than 0.4 ton per ton of incoming material in the case of prepressed seeds or seeds with low oil content. It is always less than 0.5 ton per ton, even with rich, unprepressed seeds.

Probably the biggest advantage of the system is its extreme versatility. Since the seed bed itself acts as a filter cake, fines are no problem, even when operating on seeds which tend to break up and slime. Seed bed thickness, conveyor speed and, at each extraction step, the flow of miscella can all be regulated.

The same plant is fit for processing of seeds or prepressed cakes with an oil content as low as 10% and unprepressed seeds with an oil content as high as 65% (copra). For instance, one of these plants in Lima, Peru, works normally on both unprepressed copra and cottonseed meats.

In several European countries, all seed importations were government-controlled for many years, and plants had to process any



Outside view of extractor, showing feed device in background

**Typical Performance of De Smet Extraction System on Various Types of Oilseeds**

| | Oil in Seed, per cent | Moisture, per cent | Oil in Meal, per cent |
|---|---|---|---|
| Cottonseed | | | |
| Prepressed | 18-22 | 12 | 0.4-0.7 |
| Unprepressed* | 30-40 | 12 | 0.5-0.7 |
| Soybean, Flaked | 16-18 | 8-12 | 0.2-0.4 |
| Linseed, Prepressed | up to 30 | 9-11 | 0.4-0.6 |
| Palm Kernel | | | |
| Prepressed | 18-25 | 5-8 | 0.4-0.6 |
| Unprepressed | 47-50 | 5-8 | 0.4-0.6 |

*Extractor capacity with unprepressed cottonseed is about 25% less than capacity with prepressed cottonseed.

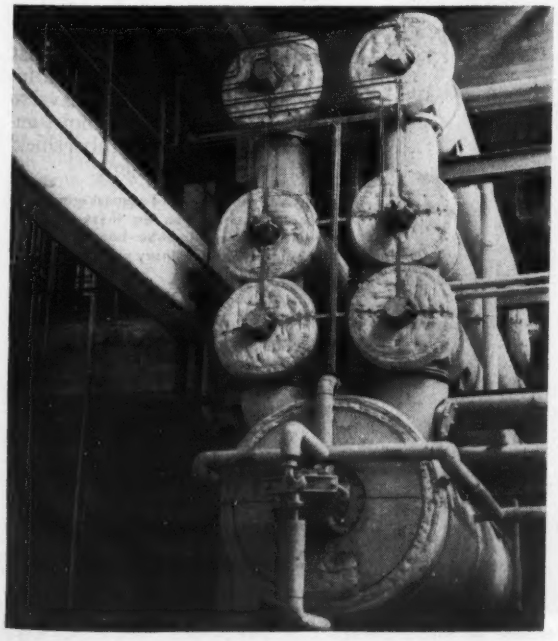
seeds bought for them by the authorities. During that period, several De Smet plants extracted as many as three different seeds in the same week, without emptying the extractor, but still without any mixing of the extracted oils or cakes. This ability is due to the principle of the horizontal extractor used in the system, which incorporates closed-circuit recirculation of the miscella.

### Extraction

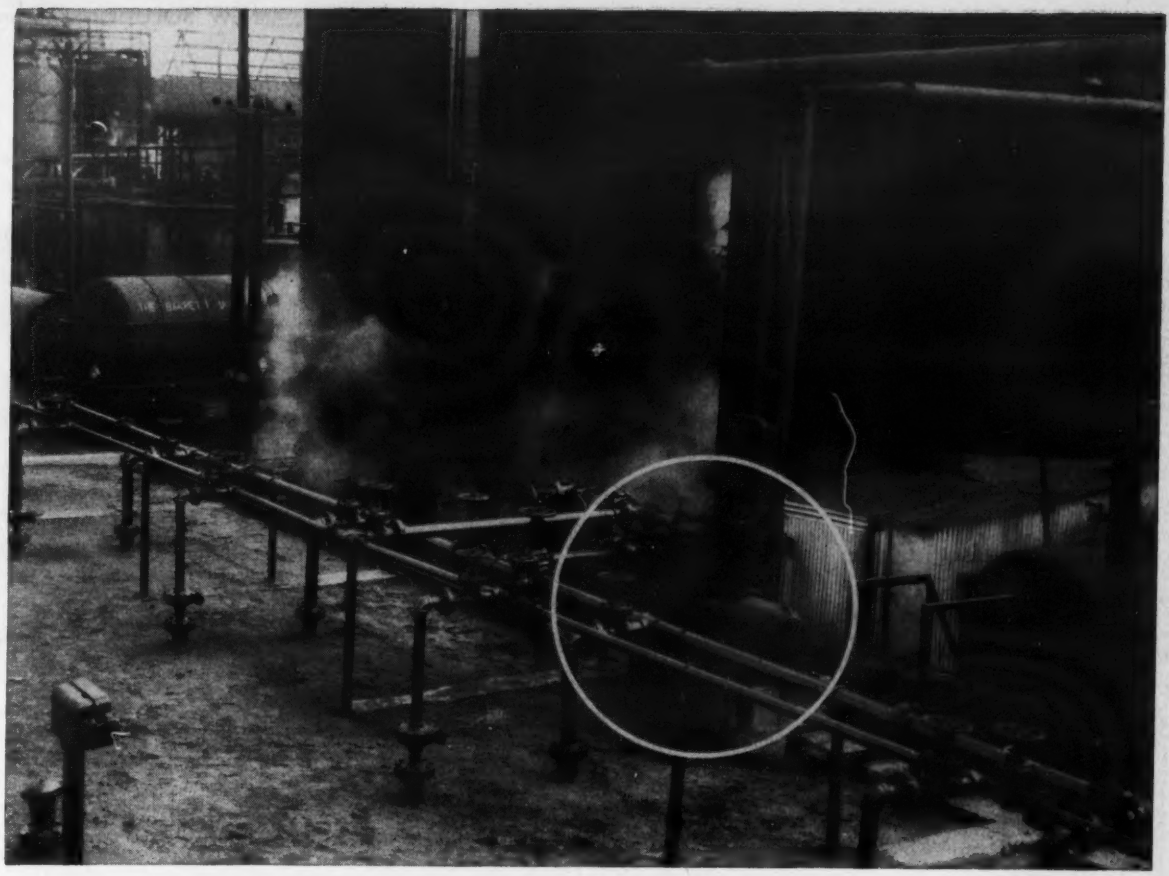
Basic principle of the extractor is that of a moving screen upon which the prepared seed is fed in an adjustable layer. A series of nozzles placed above the belt spray solvent on this moving layer of seed. The action is counter current; i.e., the seed moves in one direction and the solvent moves in the opposite direction. In this manner, the seed entering the extractor is first washed by oil-laden solvent. Subsequent washes are by solvent which contains less and less oil until the final wash which is by fresh solvent from the still.

Extractor body is of fabricated metal equipped with hydraulic, sealed covers to permit easy access. The continu-

(*Continued on page* 16)



Dryers where solvent is driven off the oil-free meal

# Air-Minded Engineering

The LaBour pump shown above is there because the engineers who planned this installation were air-minded. They had to be. The highly flexible piping plan, while it serves its purpose admirably, cannot avoid the introduction of large volumes of air into the system. The LaBour Type DPL handles the air along with the liquid without wasting any time.

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Your pumping problem may be different, but your best answer is LaBour. It has been the best answer for thirty years.

***ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP***

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When inquiring check CP 5860 on handy form, pgs. 2-3

# CHEMISEAL GASKETS

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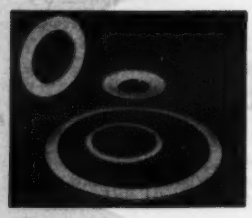
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**Solid Teflon cut gaskets are available either as ring or full face gaskets for all standard pipe sizes or for irregular shaped openings. Solid Teflon gaskets 1/16" thick generally can be used wherever a 1/16" compressed asbestos gasket would be mechanically suitable.**

**Sheet Teflon for cutting your own gaskets for field emergencies, is available in thicknesses from 1/32" and in standard sheet sizes up to 36" square. Write for catalog or send blue prints for special gasket requirements.**

**UNITED STATES GASKET COMPANY**

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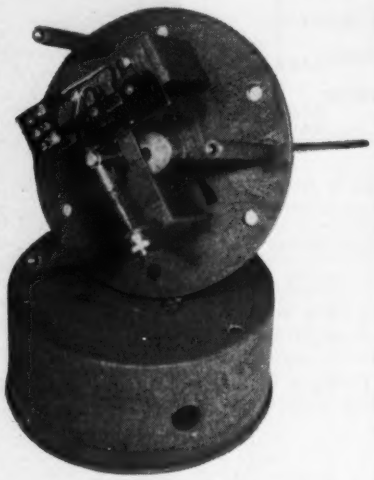
"duPont's trademark for its tetrafluoroethylene resin

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## NEW SOLUTIONS of processing problems

***Built on-the-spot, level controller works where standard types repeatedly failed . . .***

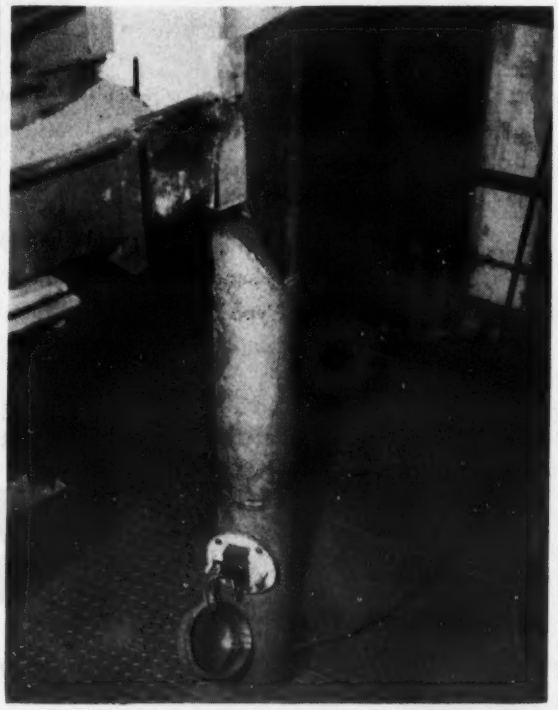
**Problem:** Among the materials handled at a chemical processing plant in New Jersey is a light, finely-ground powder with enough moisture to make it tend to pack firmly. Taken from a storage bin by a vibrating conveyor, this material drops into a vertical chute feeding the process. A level control in the chute was supposed to start the vibrator when level dropped, cut it off when level got high — was supposed to, but didn't.



Controller removed from case shows spherical seal-pivot (arrow)

Conventional diaphragm switches were soon stiffened up by a heavy coat of packed material on their diaphragm surface. A paddle type controller worked for a while, but material traveled up its shaft, fouled it, kept vibrator running continuously, choking the chute.

light, finely-ground material was moist, packed firmly — it was nemesis of diaphragm and paddle types



Cover is removed to show construction of unit on the "problem chute"


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**Cleveland 2, Ohio**

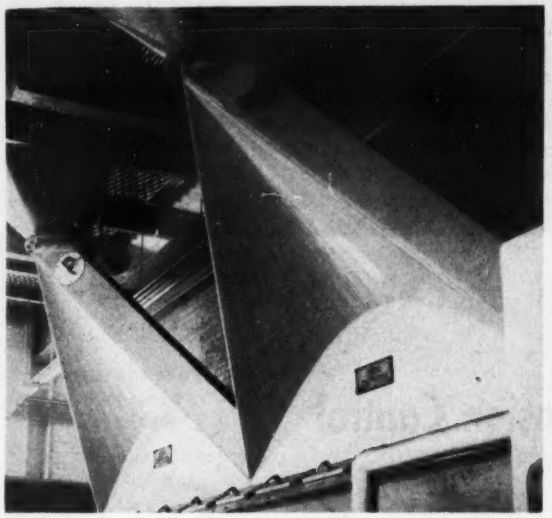
When inquiring check CP 5862 on handy form, pgs. 2-3

**Solution:** The instrument mechanic who worked on this problem designed his own controller in desperation. For a level sensing element he used a ⅜-inch rod, sticking horizontally into the chute, since this would afford a minimum chance of material build-up. Tricky problems of sealing and providing a pivot were solved by combining seal and pivot in a resilient sphere through which the rod passes.

Outside end of the rod is linked to a Micro-switch, which operates the vibrator.

Unit was installed on the problem chute and worked so well that two more were built and installed on coal feed chutes in the boiler room. A total of 9 units are now in service.

**Results:** Level in the chute is now being controlled to within about 4 inches of its optimum. And with controller adjusted to maximum sensitivity it can be held to ½-inch. Furthermore, the problem chute has behaved itself for the past 3 years since this controller was installed.



Two units (one open) are installed near top of coal chutes

(These level control units have been made available commercially. They are produced by Scrayco, 201 Greene Avenue, Bound Brook, New Jersey. . . . or for more information check CP 5863 on handy form, pages 2 and 3.)

### *Reviews problems and solutions of industrial waste treating*

Eight-page bulletin summarizes technical information concerning industrial waste treatment in several tables and a flow chart. Descriptions of different types or combinations of unit treatment processes for more than 50 wastes are given in handy table. Second chart outlines equipment used in several unit treatment operations. Bulletin also contains two-page spread flow diagram showing how various treatment processes and equipment may be combined to treat mixed wastes. Installation photos of equipment are also included.

Bul B-I-F-4 is issued by B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R. I. When inquiring specify CP 5864 on handy form, pages 2 and 3.


**40% LIGHTER**
*. . . easier to move*

This short haul moving job cuts furnace down-time from 5 months to 6 weeks. With the Lummus portable heater method, the new oil heater is built on skids near the old one. When construction is completed, the old heater is shut down and dismantled (Picture 1). Then the new one is quickly moved in place on the original heater site (Pictures 2, 3 and 4).




PHOTOS COURTESY THE LUMMUS COMPANY

Moving a 900 ton oil heater is no cinch, but it's a lot easier than budging one that weighs 1500 tons. This 600 ton difference stems from the use of *lightweight* B&W Insulating Firebrick in place of ordinary heavy firebrick in this portable oil heater.

Simplifying the moving job is only one of the advantages of B&W Insulating Firebrick . . . one *more* reason why The Lummus Company specified this lightweight brick for many portable heater installations.

Of even greater importance is the fact that B&W IFB store and conduct less heat. Thus they cool off fast, reduce down-time, make possible quick access to the furnace for inspection. Installation costs are cut, too, because these lightweight brick can be cut, drilled or shaped with ordinary woodworking tools. What's more, these lightweight brick may be supported or anchored with ordinary carbon steel. There's no need to use expensive, heat-resisting alloys.

*The defense plant expansion program has created unprecedented demands for B&W Insulating Firebrick. It is, therefore, necessary to anticipate your requirements as far in advance as possible.*

**BABCOCK & WILCOX**
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

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B&W REFRACTORIES PRODUCTS—B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment... Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

When inquiring check CP 5865 on handy form, pgs. 2-3




This lightweight, rigid block insulation, effective up to 1700° F. eliminates the need for separate high and low temperature materials. Its low thermal conductivity helps maintain proper operating temperatures in steam boilers, refinery towers, ovens, chemical treating tanks and other hot equipment.

B-H Mono-Block is stable under severe heat and moisture conditions. And finished with B-H Powerhouse Cement (which also insulates) it provides long lasting insulation with permanent high efficiency. When heat losses have you worried, get in touch with B-H Engineered Insulation Service. No obligation at all.

**Baldwin-Hill**

*Clip on signed letterhead and mail*

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BALDWIN-HILL COMPANY
881 Breunig Ave., Trenton 2, N.J.

Please send complete information on

- ☐ MONO-BLOCK ... Rigid, felted black rockwool block—for high and low temperature use
- ☐ POWERHOUSE CEMENT ... High adhesion, black rockwool insulating-finishing cement
- ☐ BLANKETS ... Metal-reinforced, flexible, felted black rockwool insulation
- ☐ NO. 1 INSULATING CEMENT ... All-purpose, rust-inhibiting plastic cement

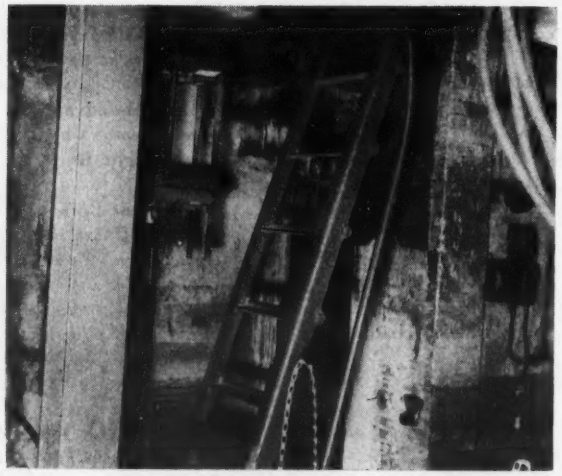
When inquiring check CP 5866 on handy form, pgs. 2-3

*New Solutions* OF PROCESSING PROBLEMS



Truck tank which received conventional paint treatment three months before photograph was taken shows effect of spillage of sodium hypochlorite

# Primer Provides Answer to Corrosion Control in Sodium Hypochlorite Plant



Girder and steel ladder show no sign of corrosion after 14 months of continual service. With conventional coatings used before this, more vibrations in the plant were sufficient to release large scales and sheets of rust

**After 14 months continual service, no sign of failure can be detected**

PROBLEM: The Kuehne Chemical Co. of Elizabeth, N. J., one of the major producers of sodium hypochlorite, uses the standard method for making the product, namely the treatment of sodium hydroxide solution with gaseous chlorine:

$$Cl_2 + 2NaOH \rightarrow NaCl + H_2O + NaOCl$$

Chemistry of the process indicates the corrosion problem encountered — that of the hypochlorite fumes which are among the most active of corrosive agents.

Activity of the product is measured in terms of available chlorine. (By definition, this is the weight of liquid or gaseous chlorine needed to exert the same effect as the chlorine compound in question.) At the Kuehne plant, concentration of corrosive fumes is calculated at 15% available chlorine.

These fumes are destructive to all steel surfaces in the plant. Various coating systems tried in an attempt to control the corrosion invariably would fail in a matter of weeks. Rust would then literally peel off the metal in large scales and sheets.

**Solution:** Employment of an inhibitive primer which allows such plants as Kuehne to take advantage of the superior chemical resistance offered by vinyl coatings. Prior to its introduction some time ago, no primer or surface preparation system existed which could be depended upon to inhibit corrosion already active on old metal and also to provide proper anchorage for vinyl top coats.

The Kuehne sodium hypochlorite plant was one of the first to take advantage of Prufcoat Primer P-50 They tried the new inhibitive primer-vinyl top coat system on the steel surfaces which had received the most severe corrosive attack — structural steel, pumps, electric motors and similar equipment.

First, the metal received routine scraping and wire-brushing to remove loose rust and corrosion. Then, one coat of Prufcoat P-50 was brushed on and allowed to dry overnight. Next day two vinyl top coats (Prufcoat "A" Series Protective Coatings) were applied, again by brush — adding up to a total approximately four mils of coating including the primer. Altogether, almost 20,000 sq ft were covered.

**Results:** Today, after 14 months of continual service, no sign of failure can be detected and all problems of underfilm corrosion appear to be checked completely.

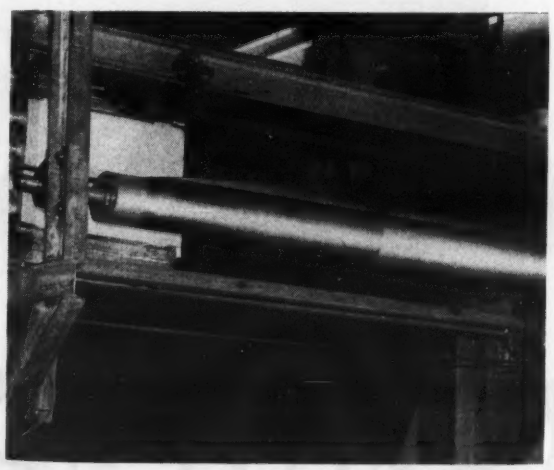
(Primer P-50 and "A" Series Protective Coatings are manufactured by Prufcoat Laboratories, Inc., Dept. CP, Cambridge, Mass. . . . or for more information check CP 5867 on handy form, pages 2 and 3.)

***55% decrease in scrap results from use of beta ray gage in quality control . . .***

recorder accessory assures uniform thickness and weight of rubber-coated fabric

**Problem:** Large amounts of scrap and off-tolerance material were imposing factors in the production line of Armstrong Rubber Manufacturing Co., Des Moines, Iowa. In the calendering of rubber-coated tire fabric into rolls, they were obliged to check the weight and

(*Continued on next page*)

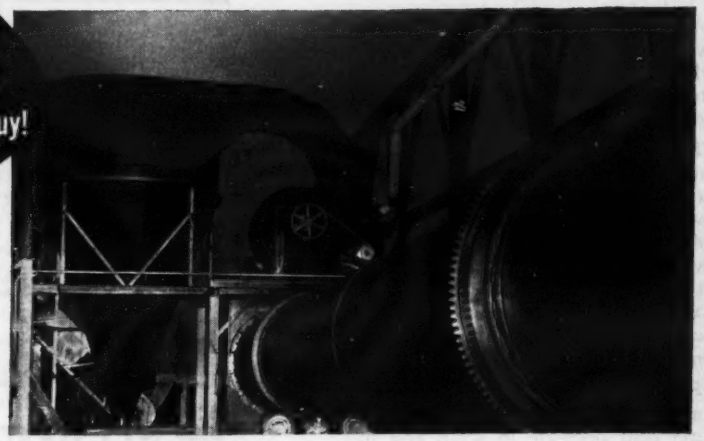


Beta ray gage is shown (upper left) checking thickness and weight of rapidly moving strip of rubberized cord


*See Louisville for*
CREATIVE DRYING ENGINEERING

**Tests prove "job-designed" LOUISVILLE DRYER will pay for itself in boosted production . . . in overall savings!**

KNOW THE RESULTS before you buy!



***FORMER DRYER***

| | |
|---|---|
| Installed cost | $109,000 |
| Daily production (tons) | 960 |
| Drying cost per ton | .432 |

***LOUISVILLE DRYER***

| | |
|---|---|
| Installed cost | $83,400 |
| Daily production (tons) | 1,200 |
| Drying cost per ton | .282 |

***YEARLY SAVINGS OF LOUISVILLE DRYER IN OPERATING COSTS ALONE . . . . . $24,000***

**Worried over high production costs? Take a look at the performance comparison shown at the left. Here's proof that a new job-designed Louisville Dryer can lift plant production by at least 25%—will pay for itself with production cost savings in less than four years.**

**Call in a Louisville engineer. Let him survey your production. From his studies, a dryer can be designed to fit your specific problem. Then, in our own unique research laboratories and pilot plant, we will predetermine the performance of your new Louisville Dryer. You know the results before you buy—and the results *must* be more than satisfactory. For complete information, write today.**

**Louisville Drying Machinery Unit**

***Other General American Equipment:***
**Turbo-Mixers, Evaporators, Dewaterers, Towers, Tanks, Bins, Filters, Pressure Vessels**

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

*Over 50 years of creative drying engineering*
**GENERAL AMERICAN TRANSPORTATION CORPORATION**
Dryer Sales Office: 139 So. Fourth Street, Louisville 2, Kentucky
General Offices: 135 South La Salle Street, Chicago 90, Illinois
Offices in all principal cities
In Canada: Canadian Locomotive Co., Ltd., Kingston, Ontario

When inquiring check CP 5868 on handy form, pgs. 2-3

*(Continued from preceding page)*

thickness of the material to maintain a three percent tolerance. This was accomplished by cutting small samples from the rubberized cord as it is rapidly emerged (approximately 50 yd/min) from the rolls. By the time the samples had been checked for tolerance, large quantities of off-tolerance fabric had often been processed. Needless to say, this method of quality control also entailed large amounts of waste and scrap.

**Solution:** A General Electric beta ray gage was installed to scan the moving sheets with radiation emitted from a tiny source of Strontium 90. The amount of radiation absorbed by fabric gives an accurate indication of material's weight per unit area. This instrument has a deviation indicator which enables the calender operator to maintain fabric at the proper standard.

Although the gage had been used successfully with steel and paper, this particular application was the first time that it had been utilized by the rubber industry.

To eliminate deficiencies in control due to human element, an automatic recorder was also installed. This device provides continuous record of operation by indicating per cent deviation and the efforts by operator to make proper adjustment. Recorder also indicates how often the gage is utilized to check the quality of the operation.

**Results:** Comparison of previous and current operation reveals a 55 per cent decrease in scrap and five per cent increase in production tonnage of rubber-coated fabric. When meter indicates deviation, operator may complete adjustment in few seconds — contrasted to 60 seconds required in previous system. This reduced the amount of off-tolerance material that would be processed during the adjustment period.

Year of operation with gage and recorder shows that 90 per cent of rolls were within three per cent tolerance. Efficiency was found to increase over period of time, as indicated by fact that 88 per cent of rolls were within tolerance during first six months and in last six months 93 per cent were within tolerance. Resulting six per cent improvement was achieved during latter period of operation.

In summary, the beta ray gage greatly improved Armstrong's roll-to-roll quality by delivering a uniform weight and thickness in each roll,


Here are your
# ARMSTRONG TRAP REPRESENTATIVES
who offer you:



**NEARNESS** —you don't have to look far or wait long for an Armstrong Man. There are 39 Factory Representative organizations and 135 stocking jobbers in the United States, Canada and Mexico. Armstrong traps and trap service are near wherever you may be.

**SERVICE** —what size trap for this job?—how to hook it up?—cold machines?—mysterious difficulties? Your Armstrong trap man will know or find the answer for you. He is factory-trained and, more importantly, he has lots of experience to help you.



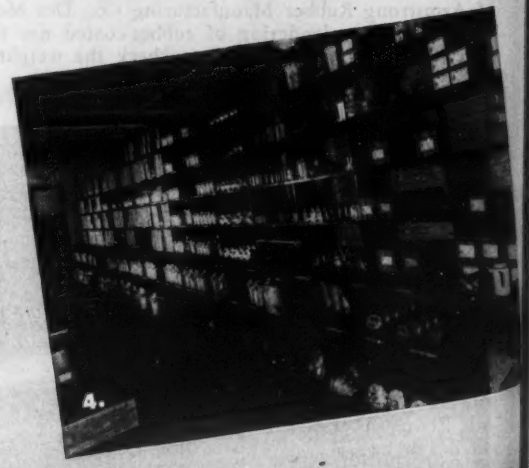

**RELIABILITY** —Armstrong Representatives are "solid citizens," established in their communities—men who will perpetuate their organizations assuring you continuity of experience and service.

**TRAPS** —no delay when you need traps—local stocks are adequate for most requirements.

**PARTS** —most Armstrong Representatives have complete stocks of trap parts on which you can draw.

**OVERHAULS** —many Armstrong Representatives offer complete trap repair and "factory overhaul" service.

When you specify Armstrong traps, you'll get no "orphans." The parental interest of the sales and service organization goes with them.




***SEND FOR YOUR FREE COPY OF THE 44-PAGE ARMSTRONG STEAM TRAP BOOK***




**ARMSTRONG MACHINE WORKS**
**880 Maple Street, Three Rivers, Michigan**

ARMSTRONG
INVERTED BUCKET
STEAM TRAP

ARMSTRONG

which in turn reduced the cost of operation and production.

(Beta Ray Gage and Recorder are products of General Electric Company, Dept. CP, Schenectady 5, N. Y. . . . or for more information check CP 5869 on handy form, pages 2 and 3.)

***Over 99% of tramp iron is removed by magnetic separators . . .***

results in customer satisfaction and elimination of fires

**Problem:** Sugar refinery was troubled with tramp iron contamination consisting of iron rust and scale from chutes, small welding beads and fine iron scraped off of grinding, sifting, and handling equipment. Fires were also a serious problem. Stray metal pieces frequently struck against machinery parts, generated sparks, and ignited raw materials. Fire hazard was particularly evident in pulverizing machines.

**Solution:** Three Eriez permanent (non-electric) Magnetic Separators were installed in processing lines. First plate-type magnet was placed in feed pipe leading to micro pulverizer. Pipe is 4¾ x 3¼" and has slope of 60°. Magnet, which measures 4 x 7", was mounted by cutting opening in underside of pipe. Depth of flow over magnet was reduced to ½" so material would all pass within effective range. Edges of installation were reinforced with flat bars for stability.

Another installation of two plate-type magnets was made in chute leading to bagging hopper. Magnets were positioned in tandem just before hopper screens. Depth of flow over magnets was reduced to 1⅛", and wedge-type plates were used as poles to produce turbulence. In this way all of material was forced close to magnets.

**Results:** Plant's maintenance foreman estimates that over 99% of the tramp iron contamination is now removed. No customer complaints are being received. Fires in pulvering equipment have been eliminated.

(Courtesy of Eriez Mfg. Co., Dept. CP, Erie, Pa. . . . or for more information check CP 5870 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 5871 . . . see information request blank between pages 2-3.



1.

**1. Armstrong Representatives at Armstrong Factory Sales Meeting, 1952.**

**2. Trap and parts stocks, Allen T. Shepherd Co., Armstrong Factory Representative, Richmond, Va.**

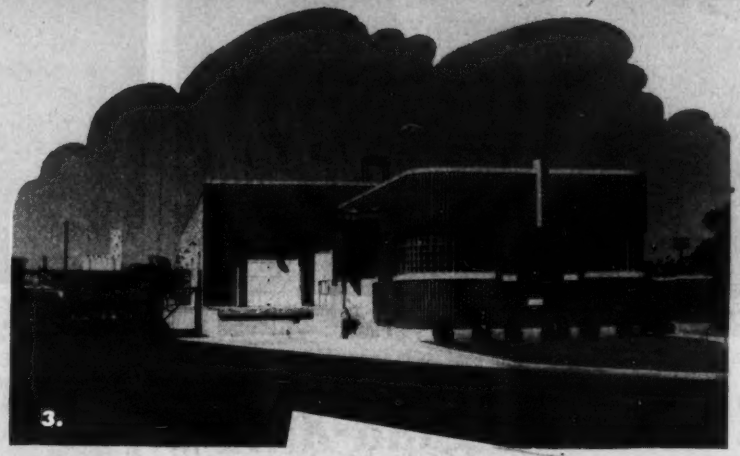
**3. Office and Warehouse, Pace, Turpin & Co., Armstrong Factory Representative, Salt Lake City, Utah.**

**4. Trap and parts stocks, Barrett-Christie & Co., Armstrong Factory Representative, Chicago, Illinois.**

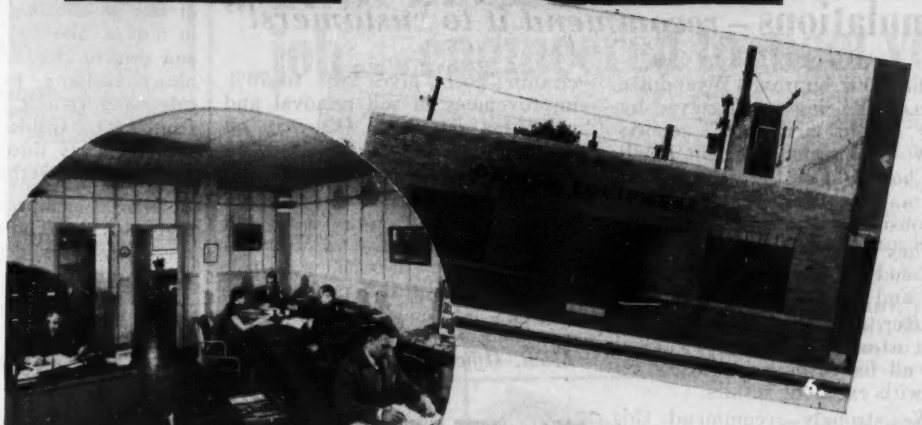
**5. Office interior, Wm. A. Milby Co., Armstrong Factory Representative, Baltimore, Md.**

**6. Headquarters of O'Brien Equipment Co., Armstrong Factory Representative, St. Louis, Mo.**

● ***ARMSTRONG STEAM TRAPS are backed by Armstrong Service.***



3.



6.

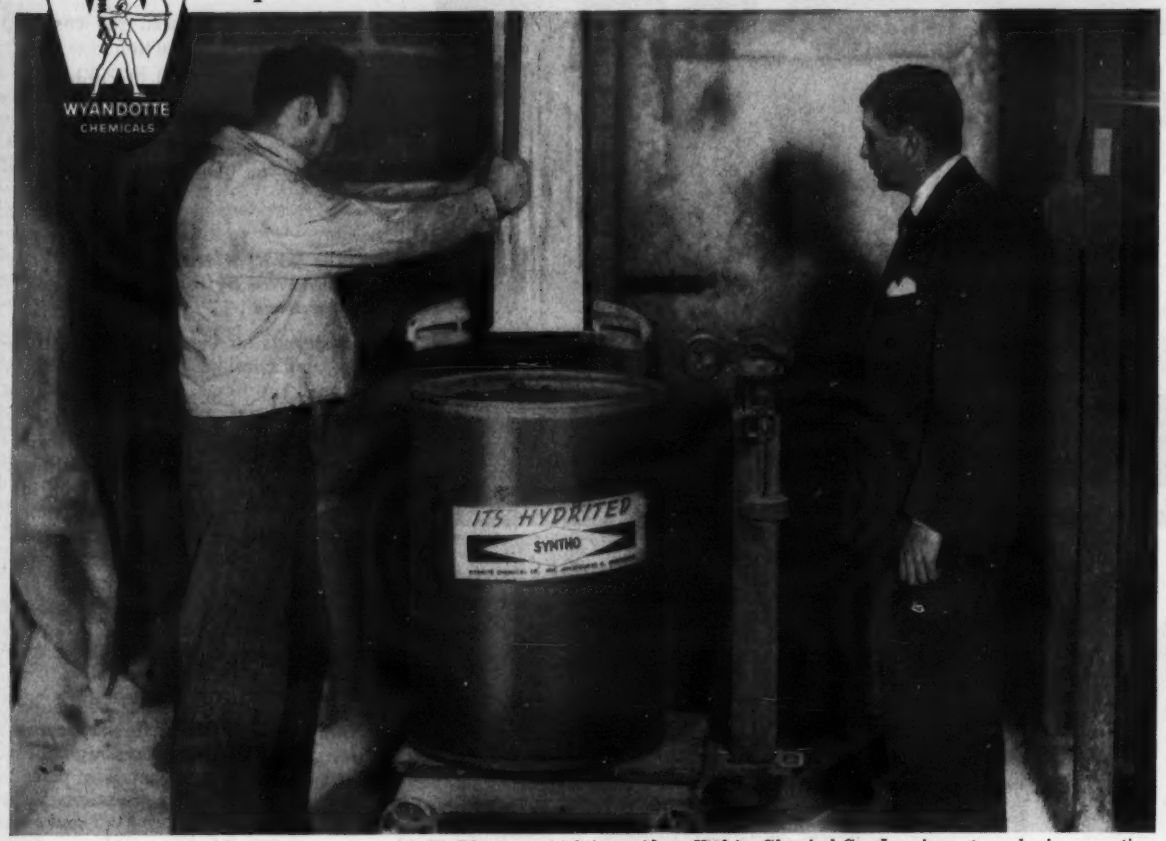


5.

# STEAM TRAPS

**SATISFACTION or your money back**

## Dependable Source for Chemical Raw Materials




*W. W. Thompson (right), president, Hydrite Chemical Co., Inc., inspects packaging operation.*

**BULLETIN BOARD**

***Caustic Soda:***

**Some cleaning compound manufacturers are finding that powdered caustic has some advantages over flake. Since other ingredients are powdered or fine-granular, a dust-suppressing oil is needed anyway; and the powdered caustic does not tend to segregate. Ask for trial quantity.**

***Soda Ash:***

**Supply of soda ash is adequate for the present; and we're expanding production to meet growing needs of old and new customers.**

***Pluronics*:***

**You'll want to look into this first 100%-active flake nonionic ever commercially available. It's another Wyandotte first. Samples and literature available.**

## "We rely on Kreelon CD for our own formulations—*recommend it to customers!*"

"We find new, improved Wyandotte KREELON is being well received by many of our customers," reports W. W. Thompson, president, Hydrite Chemical Co., Inc., distributors and manufacturers, Milwaukee, Wisconsin.

"They like its better solubility, good sudsing characteristics, clear color and uniformity.

"After thorough tests, one of our big customers recently switched over all his formulas to KREELON CD with excellent results.

"We strongly recommend this practice.

"In fact, we use KREELON CD in our own formulations. It offers the advantages of both a quality detergent and a detergent-promoter in one product, eliminates a difficult mixing operation, lowers over-all cleaning costs, gives 20% to 70% improvement in soil removal and whiteness retention. *It's easy on the hands, too.*"

Have you investigated the improved characteristics of WYANDOTTE KREELON* CD? Ask your jobber for samples and data, or write for a copy of our new 28-page KREELON book. It's packed with helpful information. *Wyandotte Chemicals Corporation, Wyandotte, Mich. Offices in Principal Cities.*

*REG. U.S. PAT. OFF.

**Wyandotte**
**CHEMICALS**
**FOR SOAPS AND DETERGENTS**

When inquiring check CP 5872 on handy form, pgs. 2-3


## NEW SOLUTIONS of processing problems

***Daily drenching in paper mill does not harm electric wire with neoprene jacket . . .***

practically no failures in six years on insulation subjected to water, chemicals, and heat

**Problem:** It is standard procedure to wash down all areas throughout the wet end of the plant at the Ecusta Paper Corp. in North Carolina. When the paper mill was built in 1939, it was wired in wet areas with type RW (water resistant) building wire jacketed with saturated braid. Triple threat of moisture, heat, and chemicals was too much for insulation. Failures began to occur after five or six years because of braid deterioration and breakdown of underlying insulation. This occurred in spite of all wiring being installed in conduit.



View in mill's bleach building shows neoprene-jacketed wire under conveyor subjected to daily wash-down

**Solution:** Company switched to neoprene-jacketed wire and now uses it exclusively in all wet locations. It is used both for new wiring and for replacement of old braid-jacketed wire when it fails. Many thousands of feet of neoprene-jacketed wiring have been installed in mill in past six years. Most of it is used in power and control circuits (600 v AC) in plant's pulp mill, bleach building, paper machine area, and electrolytic cell room (where chlorine for bleaching is produced from salt). Insulation is also used for all 5000 v AC feeder circuits throughout plant and for most outdoor wiring, both overhead and underground.

**Results:** Failures on wiring have been practically non-existent. Those that have occurred have not been caused by jacket deterioration. This good performance has resulted in spite of daily drenching when whole area is washed down. Air itself is hot and steamy and floors are wet. In many locations wiring is subjected to occasional dose of chlorine, caustic soda, or other chemicals used to digest or bleach pulp.

(Courtesy of E. I. du Pont de Nemours & Co., Dept. CP, Wilmington 98, Del. . . . or for more information check CP 5873 on handy form, pages 2 and 3.)

***Reports results of investigations of high speed nickel plating***

Eight-page bulletin gives the findings of experiments in field of nickel plating. Ten illustrations and charts picture samples and show data. Investigations were made of plating deposits of 0.001 to 0.003" in eleven minutes (at

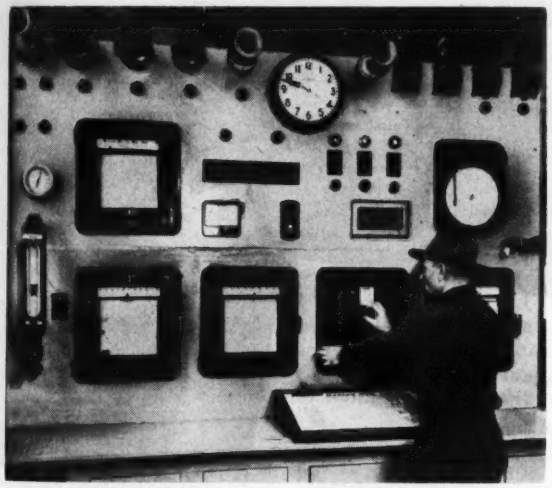
current densities of 100 to 300 amperes per square foot). Plating solutions and procedures are given in Bul EB-92/9 issued by The International Nickel Co., Inc., Dept. CP, New York 5, N. Y. When inquiring specify CP 5874 on handy form, pages 2 and 3.

***Continuous pH record warns when pH adjustments near operating limits . . .***

and other instruments govern air rate and burner temp in sulfuric acid plant

Primary use of recorders at Marion Manufacturing plant in Indianapolis is to maintain quality of product, but they also help guard plant equipment against corrosion. All plant water — waste heat boiler, boiler feedwater, and recirculated cooling water — is subject to adjustment of pH for proper water treatment control. In order to keep adjusted water from causing serious corrosion, glass electrode pH cells have been installed.

In order to keep corrosion from affecting the electrodes themselves, leads have been molded in plastic caps. Thus water can't leak in and the electric signal is kept from "leaking" too. Readings from pH cells are brought to a central control panel where, when pH drops too low, an operator can take corrective measures.



**Operator checks temperature on scanning instrument. Other instruments tell $H_2SO_4$ concentration, $SO_2$ concentration, and pH**

Air to sulfur burners is controlled in accordance with $SO_2$ concentration. Gas sample leaves the burners at 1500°F, is conducted through vitreous pipe to a coke tower where sulfuric acid mist is removed. Then sample gas moves into a glass-lined sulfur dioxide concentration cell. Signal from the cell operates a recorder on the central panel.

Temperature in the catalytic converters is an important variable because an unchecked temperature rise could ruin the expensive vanadium catalyst. Gas passing through the catalyst is therefore checked with a number of chromel-alumel thermocouples connected to a multi-point recorder. Additional readings can be taken with a manually operated scanning instrument.

(This instrumentation was furnished by Leeds & Northrup Company, Dept. CP, 4901 Stenton Ave., Philadelphia 44, Pa. . . . or for more information check CP 5875 on handy form, pages 2 and 3.)

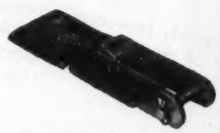

# no ONE chain serves every purpose



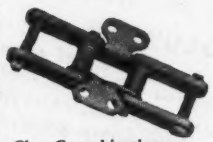
*Link-Belt Drag Chain Conveyor, employing a single strand of H-480 Promal chain, handling 150 tons per hour of ground limestone. Here the right chain for a specific job means more efficient performance, reduced operating costs.*

## LINK-BELT offers the RIGHT chain for every job . . . engineered to meet your requirements

**Typical chains from the complete Link-Belt line**



Class SS bushed roller chain with straight sidebars —for practically any conveying or elevating service.



Class C combination chain — popular, durable, low cost design for elevators, conveyors.



Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.



Class 800 ley bushed chain—for heavy duty, severely abrasive conveying and elevating.

Link-Belt offers no single "cure-all" chain to handle every job. From the most complete line of chains and sprockets—we can recommend the best type to fit your particular requirements—cast, combination, forged and fabricated steel, roller or silent. So, whatever your chain problems, big or small, Link-Belt engineers will work with you or your consultants to help solve them.

**LINK-BELT COMPANY,** Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

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LINK-BELT

*CHAINS AND SPROCKETS*

When inquiring check CP 5876 on handy form, pgs. 2-3

## Solvent extraction

(*Continued from page 7*)

ous conveyor is composed of a series of articulated frames of monel wire cloth backed up by perforated metal. Conveyor is driven by a variable speed reduction gear. Thickness of the seed layer on this moving belt is regulated by plate located near the feed hopper. Fresh solvent enters extractor through pump (P.1 on flow diagram), and is sprayed on the seed layer through spray (A1). After percolating through the layer, the solvent is collected in hopper (G). It is then picked up by pump (P.2) and sprayed through nozzle (A2). Each pump in the series of extractions recirculates the solvent between the same spray and hopper.

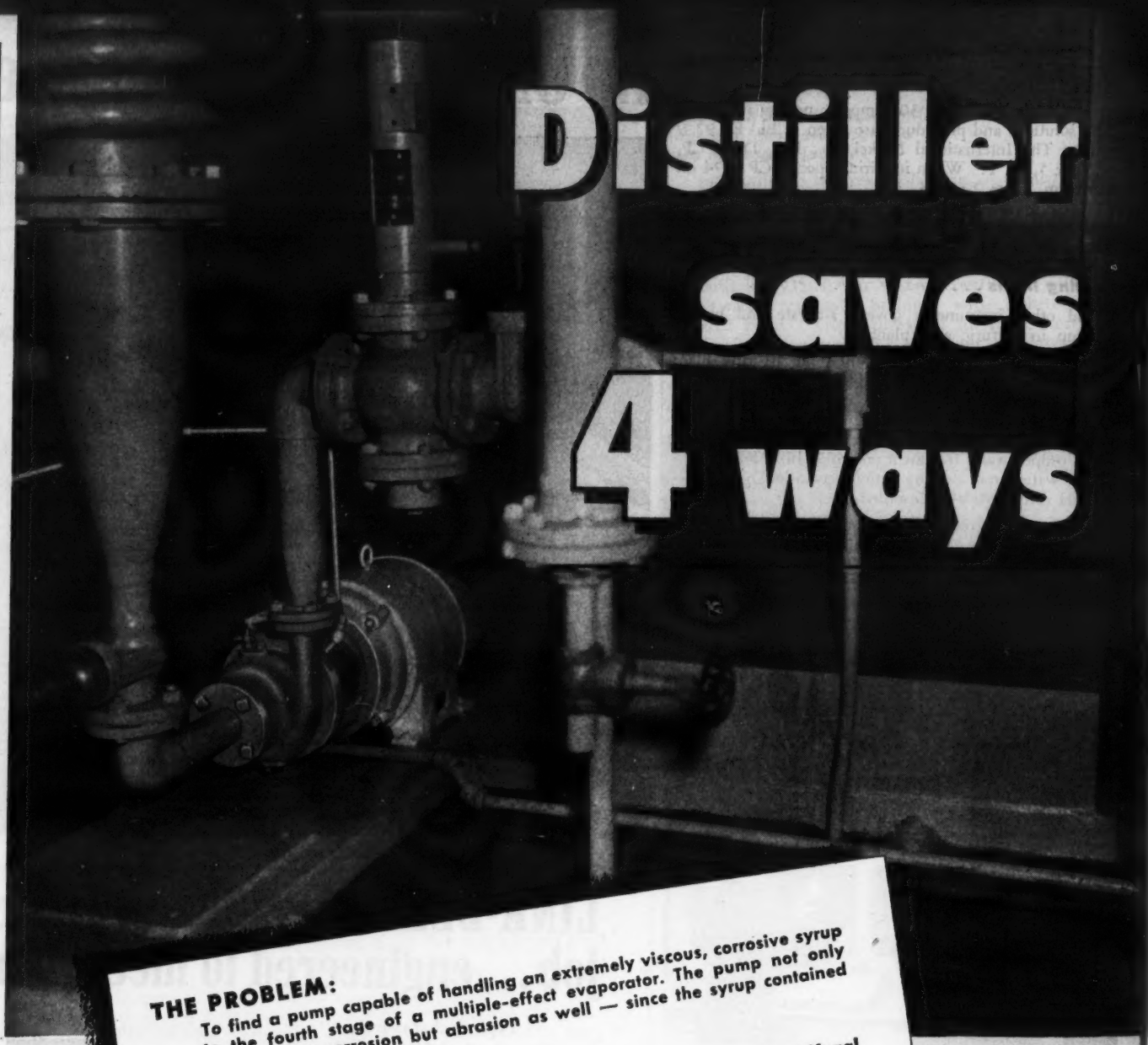
Movement of the solvent through the system is by means of overflow from one hopper to another. Thus, fresh solvent entering the system causes hopper (G) to overflow to hopper (F) which in turn overflows to hopper (E), etc. Finally the oil-laden solvent is received in hopper (I) and flows to the miscella tank (7), and at this point the miscella is subjected to a continuous brine wash to remove gums and residual fines. The brine is recirculated by pump (P.17). Normally this brine is renewed only once a week. The clear miscella overflows in tank (17) and is pumped (P.8) to the still (18).

A portion of the clear miscella is used to backwash the screen through spray (A10). This serves to keep the screen clean. Cake which is washed from the screen is continuously pumped by pump (P.9) to spray (A9) where it is distributed on top of the seed layer entering the extractor. No miscella filter is used.

### Meal Drying

Extracted meal is discharged from the extraction unit through a star valve (8). It is led by a conveyor (4) or by gravity to a series of meal dryers (6). These consist of steam jacketed cylinders in which are fitted a series of rotating blades. Blades agitate meal and, simultaneously, move it along length of cylinder.

Finally, the meal enters the finishing dryer (7). This is a large steam-jacketed cylinder with a rotating steam coil. Revolving blades throw the meal against this coil and also serve to move the meal through the dryer. Open steam is also circulated in this finishing dryer to remove the last traces of solvent. Extracted meal leaves the dryer through a star valve (8), and follows a path through a humidifier (11) and a tray meal-

# Distiller saves 4 ways

**THE PROBLEM:**
To find a pump capable of handling an extremely viscous, corrosive syrup to the fourth stage of a multiple-effect evaporator. The pump not only had to resist corrosion but abrasion as well — since the syrup contained up to 35% solids.

**THE SOLUTION:**
The installation of a compact, low-capital-investment Ampco Centrifugal Pump — the pump made of durable Ampco Aluminum Bronze Alloys that resist abrasion, corrosion, and cavitation-erosion — a special pump at a standard-pump price.

**THE RESULTS:**
More than a year of day-in, day-out service proved the dependability and efficiency of Ampco Centrifugal Pumps.

The corrosion problem is solved. The pump shows practically no signs of wear —despite the high percentage of abrasive solids it handles. Power costs are ⅓ less. Space savings are tremendous. And process efficiency is improved — shutdowns are infrequent, minimum cleaning is required, because the pump maintains a constant liquid level in the evaporator tubes.

Ampco Centrifugal Pump installed in Foods and Feeds Department, Joseph E. Seagram & Sons, Inc. Distillery, Lawrenceburg, Indiana.



Outside and internal sections of a 10" Barometric Condenser

1. Uses 66% less power
2. Cuts space requirements
3. Improves process efficiency
4. Eliminates weekly pump maintenance

. . . with Ampco Centrifugal Pump made of

**AMPCO* BRONZES**

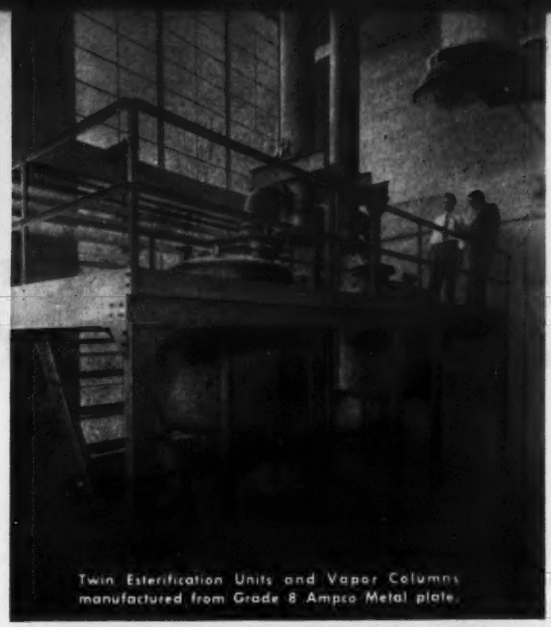
**—resistant to abrasion, corrosion and cavitation-erosion**

Ampco engineered aluminum bronze alloys have high resistance to corrosion, erosion and abrasion.

That's why you find them used in both the process industries and marine service — used for tanks, pipe, fractionating towers, bubble caps, separators, condenser water boxes, agitators, stills, etc.—wherever there's a need for high resistance to these thieves of production time and money.

That's why Ampco Centrifugal Pumps save you money when the going is tough. They're the pumps made from Ampco — the pumps that resist the destructive action of corrosion, abrasion and cavitation-erosion.

Ampco aluminum bronzes make good where other metals fail. Perhaps they can help you. They're available in a wide variety of forms — sheet, plate, extrusions, pipe, tubes, fasteners, etc. They can be easily fabricated with Ampco-Trode* electrodes. Consult your nearest Ampco Field Engineer or write us for further information.



Twin Esterification Units and Vapor Columns manufactured from Grade 8 Ampco Metal plate.



Sulfuric acid sludge tank, made of Grade 8 Ampco Metal plate under construction at large Pacific Coast Refinery.

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☐ Send me information on the application of Ampco Aluminum Bronzes for corrosion-resistant service in the Process Industries.

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PR-9.


cooler (13) which produces a meal of proper moisture content, temperature and consistency for storage. Vapors from the dryer pass through a dry dust catcher (28) and a final wet dust catcher (29), and are condensed by condenser (20).

### Miscella Distillation

This distillation unit (18) consists of the following principal parts:

1. A falling film evaporator (18) which delivers oil with a maximum solvent content of 4%. This remaining 4% of solvent is removed in the stripping column (22).
2. Vertical surface condenser (19) to condense the evaporated solvent. Special tube construction facilitates cleaning of tubes in case of dirty cooling water.

Oil from the distillation unit passes through a heater (21) to the stripping column (22). Stripping is done under vacuum and with a counter-current flow of open steam. Finished oil is discharged by pump (P.22).

### Solvent Recovery

All vapor vents are connected to a common pipe which leads through cooler (35) to the refrigeration unit, where the remaining solvent is condensed at a low temperature and recovered.

(System is a development of Extraction Continue De Smet, S. A., 38, avenue de France, Antwerp, Belgium. Sales agent in the United States and Canada is Mr. William Stockdale, located at the offices of The Sharples Corporation, Dept. CP, 2300 Westmoreland St., Philadelphia 40, Pa. . . . or for more information check CP 5877 on handy form, pages 2 and 3.)

### *Economic factors of flotation*

Factors of flotation which affect economic recovery are considered in four-page bulletin.

Comparative screen analyses of concentrates from different types of flotation units are included. Data are also given for sizing analyses of tailings for same types of machines.

Bul F10-B13 is issued by Denver Equipment Co., Dept. CP, Denver, Colo. When inquiring specify CP 5878 on handy form, pages 2 and 3.

For more information on product at left, specify CP 5879 . . . see information request blank between pages 2-3.

# Silicone Resins Useful in Heat-stable and Weather-resistant Coatings

**Compatibility of silicones with organic resins gives coatings with well-balanced characteristics**

VERSATILE and well-balanced coatings may be formulated by incorporating one or more of a number of silicone resins. The resins are either partially or completely compatible with a wide range of organic resins, and may be blended with these to yield weather-resistant, heat-stable, or mar-resistant paints.

## Silicone Resin XR-261

**Uses:** Used in formulation of heat-stable modified silicone paints.

**Features:** Very compatible with organic resins. Can be blended cold.

**Description:** Silicone resin XR-261 is a low-viscosity paint resin which will air-dry to a tack-free film. When cured for 1 hour at 480°F, it gives a hard film of limited flexibility. Material is soluble in aromatic hydrocarbons, chlorinated solvents, ketones, butyl alcohol, ethyl acetate, butyl acetate, dibutyl ether, and butyl carbitol. XR-261 is completely compatible with reactive and non-reactive phenolics, acrylic esters, urea formaldehyde, coumarone resins, ethyl cellulose, chlorinated diphenyls, ester gum, tung oil, linseed oil, styrenated alkyds, and vinyl butyrate. It is partially compatible with oxidizing and non-oxidizing alkyds, melamine formaldehyde, nitrocellulose, vinyl chloride-acetate, and polystyrene.

## Silicone Resin XR-379

**Uses:** Material is used to give formulations improved color retention and adhesion.

**Features:** White enamels formulated with material have improved color retention at high temperatures.

**Description:** Resin XR-379 is a modified silicone paint resin available as a 50% resin solids solution in xylene and cyclohexanone. It it completely compatible with many organic resins including alkyds.

The weather-resistance of the material compares with that of unmodified silicone resins. After 1500 hours of weatherometer testing, panels coated with a white enamel, containing XR-379 and an anatase-type titanium dioxide pigment, exhibited no signs of chalking or corrosion.

Resin XR-379 is soluble in ketones, acetates, lactates, and mixtures with aromatic hydrocarbons. Material is completely compatible with non-oxidizing alkyds, reactive and non-reactive phenolics, urea formaldehyde, triazine formaldehyde, coumarone-indene, nitrocellulose, ethylcellulose, chlorinated diphenyls, and ester gum. It is partially compatible with unsaturated alkyds, acrylic esters, melamine formaldehyde, urea-melamine, vinyl chloride-acetate, and vinyl butyrate.

## Silicone Resin 801

**Uses:** Manufacturer particularly recommends material for the formulation of protective coatings which will be exposed to extreme heat or severe weather conditions.

**Features:** When pigmented with aluminum powder, material gives coatings which are extremely stable to heat.

**Description:** Silicone resin 801 is clear to light straw in color. The uncatalyzed resin forms a tack-free film upon baking from 1 to 3 hours at 390°F. By the addition of 0.05 to 0.2% cobalt or zinc, the curing time necessary to obtain tack-free coatings can be shortened to one hour or less at 390°F. Panels coated with aluminum-pigmented silicone resin showed no checking after 2800 hr at 480°F.

Properly cured, films of resin 801 are resistant to dilute and concentrated acids and alkalis, salts, and oils. They show good resistance to aliphatic solvents and some alcohols. Their resistance to chlorinated and aromatic solvents is poor.

Material is completely compatible with chlorinated diphenyls, ester gum, ethyl cellulose, and non-reactive phenolics. It is partially compatible with other type phenolics, methacrylates, coumarone-indene, urea formaldehyde, nitrocellulose, vinyl chloride, and styrenated alkyds.

Resin 801 is soluble in aromatic hydrocarbons and other hydrocarbons having kauri-butanol values greater than 50. Also soluble in ketones, acetates, chlorinated solvents, butyl alcohol, butyl cellosolve, butyl carbitol, and ethyl hexanol.

## Typical Properties of Silicone Resins

| | XR-261 | XR-379 | 801 | 802 | 803 | 804 | XR-807 |
|---|---|---|---|---|---|---|---|
| Solids Content, % | 70 | 50 | 60±1 | 50±1 | 50±1 | 60±1 | 50±1 |
| Color, Gardner | 2(max) | 10(max) | 2(max) | 2(max) | 2(max) | 2(max) | 10-12 |
| Specific Gravity, 25°C | 1.10-1.12 | 1.039 | 1.04-1.06 | 1.00-1.02 | 1.02-1.04 | 1.05-1.07 | 0.996 |
| Viscosity at 25°C, cp | 100-200 | 50-100 | 100-300 | 100-200 | 100-200 | 20-40 | 3-8 (poises) |
| Viscosity at 25°C, G-H | D-H | —— | D-L | D-H | D-H | A-3 to A | —— |
| Solvent | Xylene | Xylene and cyclohexanone | Xylene | Xylene | Xylene | Toluene | Xylene and Solvesso #3 |
| Drying time, hours | —— | 3-5 | 1(max) | 3(min) | 1(max) | 1(max) | 5-16 |
| Drying temperature | —— | 150°C | 250°C | 250°C | 100°C | 100°C | 100°C |
| Curing time, hours | —— | 1 | —— | —— | —— | —— | 0.5 |
| Curing temperature | —— | 200°C | —— | —— | —— | —— | 150°C |

## Silicone Resin 802

**Uses:** Used in formulation of white or light-colored enamels.

**Features:** Produces coatings which have well-balanced characteristics of hardness and flexibility.

**Description:** Resin 802 forms a tack-free film after baking 1 to 3 hours at 480°F. The addition of 0.1 to 0.2% cobalt or zinc shortens the curing time necessary to obtain tack-free coatings to 3 hours or less at 390°F. Panels coated with the resin showed signs of checking only after 3200 hours at 480°F. Addition of catalyst raised this figure to 5000 hours at 480°F.

Properly cured films of this material have resistance properties similar to those of resin 801.

Resin 802 is completely miscible with chlorinated diphenyls, ester gums, ethyl cellulose, and non-reactive phenolics. It is partially compatible with other types of phenolics, methacrylates, coumarone-indene, urea formaldehyde, nitrocellulose, vinyl chloride, and styrenated alkyds.

Material is soluble in aromatic hydrocarbons having kauri-butanol values greater than 50. It is also soluble in ketones, acetates, chlorinated solvents, butyl alcohol, butyl cellosolve, butyl carbitol, and ethyl hexanol.

## Silicone Resin 803

**Uses:** Generally used in combination with silicone resin 802 to produce coatings with well-balanced characteristics of hardness and flexibility.

**Features:** May be used as an electrical resin and as a coating for molds to aid the release of rubber and plastic articles.

**Description:** Resin 803 will air-dry to a tack-free film, and, when cured one hour at 480°F, gives a hard film of limited flexibility. If a catalyst is desired, 0.05% cobalt may be added, although any of the common metal paint driers, including iron and zinc, can be used to shorten the drying time. Test panels coated with uncatalyzed resin showed signs of checking only after 1600 hours at 480°F. Use of cobalt (0.05%) raised this figure to 2900 hours at 480°F.

Resistance qualities of the material are similar to those of Resin 801.

Resin 803 is completely compatible with chlorinated diphenyls, ester gum, ethyl cellulose, methacrylates, and non-reactive phenolics. It is partially compatible with other types of phenolics, coumarone-indene, urea formaldehyde, nitrocellulose, vinyl chloride, tung oil, and styrenated alkyds.

Material is soluble in aromatic hydrocarbons and other hydrocarbons having kauri-butanol values greater than 50. It is also soluble in ketones, acetates, chlorinated solvents, butyl alcohol, butyl cellosolve, butyl carbitol, and ethyl hexanol.

## Silicone Resin 804

**Uses:** Formulation of coatings when a hard and mar-resistant surface is desired.

**Features:** Material is heat-stable; fast curing gives glossy coating completely free from yellowing and with good moisture resistance.

**Description:** Resin 804 will air-dry to tack-free film in uncatalyzed form, and, when cured one hour at

(*Continued on next page*)





For close to 30 years, Glycerine has insured a uniform blend of flavor and prevented dried out edges in every Chase "Pep-R-Mint." Hard and smooth to the touch . . . each lozenge is mellow and creamy to the taste!

**FULLY ACCEPTED . . . FULLY AVAILABLE IN ALL GRADES!**

In the food processing field, Glycerine's major contribution has been in preserving freshness and maintaining palatability. It is completely acceptable as to taste and odor.

In artificial flavors, extracts, oils and essence, it assures an even and thorough dispersion of both flavoring and coloring materials. It may serve as a sweetener, solvent or blending agent. And recent research has indicated that it will lengthen the shelf life of butter creams and similar perishables by suppressing fatty acid formation.

Only Glycerine can supply this remarkable range of advantages—plus the assurance of physiological safety. Its use has been accepted by medical associations and government agencies . . . and production is meeting the demands of volume users. Its applications? Write for a copy of "Why Glycerine for Foods?"

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**295 Madison Avenue, New York 17, N. Y.**

When inquiring check CP 5880 on handy form, pgs. 2-3

*(Continued from preceding page)*

480°F, gives a hard film of limited flexibility. Most metal driers tend to shorten the flex and craze life of material.

Material is completely compatible with chlorinated diphenyls, ethyl cellulose, methacrylates, melamine formaldehyde, tung oil, linseed oil, and non-reactive phenolics. It is partially compatible with other type phenolics, urea formaldehyde, nitro-cellulose, vinyl chloride, vinyl butyrate, ester gum, oxidizing alkyds, and styrenated alkyds.

Resin 804 is soluble in aromatic hydrocarbons and other hydrocarbons having kauri-butanol values greater than 50. It is also soluble in ketones, acetates, chlorinated solvents, butyl alcohol, butyl cellosolve, butyl carbitol, and ethyl hexanol.

### Silicone Resin XR-807

**Uses:** Used as a vehicle in formulating paints and varnishes for general outdoor application.

**Features:** Coatings formulated with resin have longer life and good resistance to weathering.

**Description:** Resin is used to improve chalking characteristics and to increase the life of paints made with conventional organic resins. Finishes made with XR-807 have good moisture-resistance after air drying. Baking increases moisture-resistance of coating made with this material.

XR-807 is a drying-oil modified, silicone-alkyd resin, containing 25% silicone. When catalyzed, it will air-dry tack-free. Recommended catalyst combination includes 0.03% cobalt, 0.03% manganese, and 0.05% calcium. In addition, an anti-skinning agent should be added at a concentration of 0.05%, based on resin solids, to inhibit the tendency to skin induced by the catalysts.

Resin XR-807 is compatible with most short to medium-long oil-modified alkyds, reactive and non-reactive phenolics, urea formaldehyde, melamine formaldehyde, triazine formaldehyde, coumarone, chlorinated diphenyls, ester gum, tung oil, and styrenated alkyds. It is partially compatible with nitrocellulose and linseed oil.

Material is soluble in aromatic hydrocarbons, ketones, chlorinated solvents, butyl acetate, butyl cellosolve, ethyl hexanol and mineral spirits having kauri-butanol values greater than 45.

(Silicone resins are products of Dow Corning Corp., Dept. CP, Midland, Mich. . . . or for more information check CP 5881 on handy form, pages 2 and 3.)

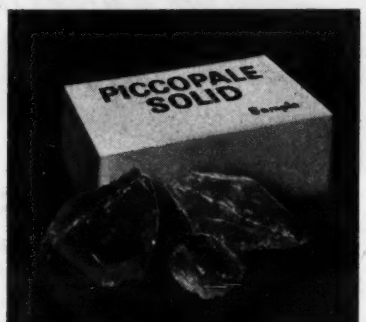
### *Tests show good resiliency for portland cement mortars that contain polyvinyl acetate*

During the past year extensive work has been undertaken at Massachusetts Institute of Technology aimed at improving the resiliency of portland cement mortar. Such additives as neoprene, butadiene-styrene copolymer, calcium acrylate, sodium polyacrylate, and polyvinyl acetate were tried, and it was found that best results were obtained with the addition of a polyvinyl acetate water emulsion.

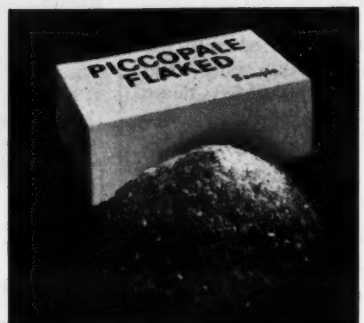
This emulsion was first diluted with water to give the desired water-to-cement ratio in the mortar, and then the







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Clear, Clean

Transparent, Thermoplastic

Available in Enormous Quantities








PICCOPALE is a completely new type of synthetic resin—not just another variety of one of the familiar types. It is entirely different from anything developed heretofore . . . is produced in very large quantities . . . and is priced low enough to make it feasible for use as a basic raw material.

PICCOPALE offers a new approach to improved quality and lower costs. This brand-new synthetic resin, developed and produced by Pennsylvania Industrial Chemical Corporation provides good chemical resistance, pale initial color, excellent compatibility and ready solubility.

If you are interested in a bulk material that is absolutely waterproof, that is easy to use with other materials, that is low in cost, high in quality and readily available, investigate PICCOPALE!

We will be glad to send complete data and samples. Please specify application, and whether the sample of PICCOPALE should be in the form of flake, solid or a liquid solution.

write for complete data and samples

CORPORATION

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CLAIRTON, PENNSYLVANIA

Please send sample of PICCOPALE for (*application*)

(*check*) flake ☐ solid ☐ liquid solution ☐

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When inquiring check CP 5882 on handy form, pgs. 2-3

cement and sand were added. It was found that the diluted emulsion could be added to the mixed sand and cement. Water-to-cement-to-sand ratios were determined from the usual ASTM test procedures covering compressive and tensile strengths of mortars.

Generally speaking, the compressive strength of mortar containing polyvinyl acetate is lowered slightly (by about 1/10th) while the tensile strength and extensibility are markedly increased with the addition of polyvinyl acetate emulsion *plus* dry curing conditions. It should be pointed out that plain cement mortar requires moist or wet curing to develop its maximum strength.

Mixtures tested were found to have at least three times the best field strength attainable with plain cement mortar, and five times the most likely field strength of plain cement mortar. Mixtures giving the above test strengths contained polyvinyl-acetate-solid-to-cement ratio of 0.43, with a sand ratio of 3. This mortar had increased abrasion resistance, increased bond (to steel and old brick) strength and increased extensibility in addition to the increased tensile strength.

Obviously, these tests were made with mortar and not with concrete. Some little time has been spent trying to design a concrete mixture which can make use of the increased tensile strength. However, it has been found that with machine mixing of concrete, too much air is entrained and this substantially weakens the mixture. Thus, care must be taken in applying the results with mortar to concrete.

The main use foreseen for this mortar is as a thin resilient floor topping about 3/16 to ¼" thick laid on top of a base concrete or brick floor. Also, as a resilient mortar for cementing bricks together where they are subjected to vibration.

Corrosion resistance of the material has not been investigated fully as yet. Exhaustive tests should be carried out before use in corrosive conditions. It should be emphasized that merely laboratory work was conducted here, although some field tests are being currently carried out by private parties. According to reports from England, a polyvinyl acetate cement mortar has been used with some success.

(Information submitted by Mr. Brian B. Mellor, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.)

### *Rubber-to-metal adhesive forms resistant bonds*

A rubber-to-metal adhesive which produces bonds with high degree of resistance to solvents, corrosion, aging, and shock is described in 8-page bulletin.

Compound is used to bond natural rubber, GRS, neoprene, or nitrile rubber to iron, steel, stainless steel, aluminum, zinc, magnesium, brass, monel, nickel.

The manufacturer of the compound states that bonds are resistant to aromatic and aliphatic solvents, aging, shock, and boiling water.

Tables summarize adhesion test data using adhesive and many other types of materials. Detailed instructions are presented on proper use of product.

Bul 4061 is issued by The General Tire and Rubber Company, Chemical Division, Department CP, Akron, Ohio. When inquiring specify CP 5883 on handy form, pages 2 and 3.

### *Stop coagulation of resinous, proteinaceous materials in pulp, paper processing*

The pulp and paper industry can minimize coagulation of resinous and proteinaceous materials by the application of either of two sodium salts of a condensed naphthalene sulfonic acid. The products, Blancol Conc. Powder and Blancol Conc. Fine Powder N, can be used in the processing of all types of paper without any danger of causing trouble in mill operations, according to manufacturer.

Blancol Conc. Powder is supplied as tan granules readily soluble in warm or cold water; Blancol Conc. Fine Powder N is a pale yellow-tan powder of equal solubility. Their specific functions are enumerated as follows:

1. Preventing coagulation of pitch
2. Controlling occurrence of slime growths
3. Minimizing sticking at the presses
4. Improving utilization of rosin size
5. Obtaining better formation and retention of fines
6. Improving filler retention
7. Lowering viscosity of coating slips
8. Reducing two-sidedness
9. Maintaining high internal sizing, improving erasability, printability, physical test values
10. Mordanting basic dyestuffs
11. Minimizing graniting
12. Lessening foam troubles
13. Aiding in good-housekeeping

(Products of Antara Chemicals Division of the General Dyestuff Corporation, Dept. CP, 435 Hudson Street, New York 14, N. Y. . . . or for more information check CP 5884 on handy form, pages 2 and 3.)

### *Chart identifies 70 military alloy steel specs*

Two-page chart serves as file-card reference to identification of alloy steel specifications. It shows chemical analysis for each of 70 military, Army, Navy, Aeronautical, and federal specifications. Chart also lists specified forms (sheets, bar, tubing, etc) and nearest corresponding SAE, AISI, and AMS type numbers. Chart Sec. D, No. 1 is issued by Peter A. Frasse and Co., Inc., Dept. CP, 17 Grand St., New York 13, N. Y. When inquiring specify CP 5885 on handy form, pages 2 and 3.

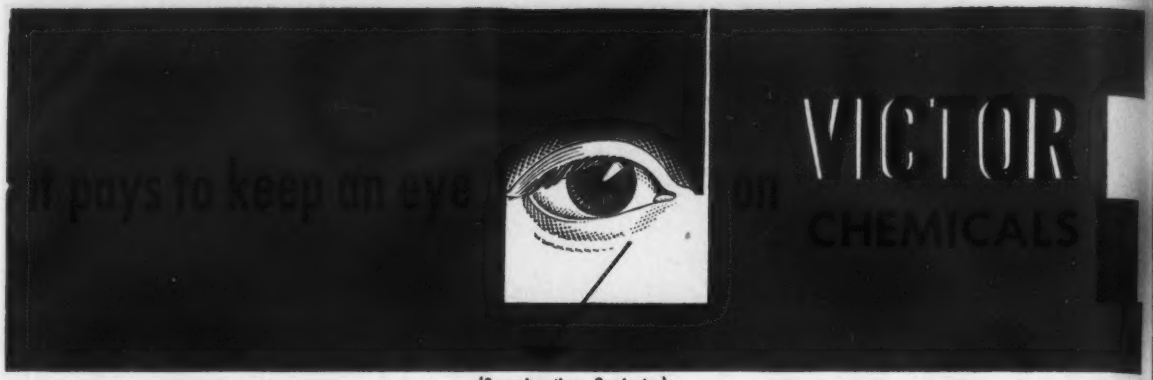
### *Offers source of phytyl radical for salts of halogens, vitamins E and K . . .*

20-carbon alcohol has been considered for suppressing flash point of petroleum products

**Uses:** Raw material for introduction of phytyl radical into such compounds as vitamin E, vitamin K, and salts of halogens. Besides being source of phytyl radical, isophytol should be of interest in petroleum, rubber, organic and other fields where a long chain carbon molecule with methyl side chains might have applications.

It has been considered in compounds to suppress flash point of petroleum products such as high octane gasoline, and also to combine with naphthaquinone to form anti-bacterial agents.

**Features:** Possesses same molecular weight (296.5) as phytol and under acid conditions behaves exactly as


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Victor monoammonium and diammonium phosphate, the Fyrex® group, and Victamide* *are* doing things for industry. From matches to building materials, manufacturers will tell you that the ammonium phosphates are the most efficient flameproofing agents known for their products. These busy chemicals are used extensively to flameproof paper, wood, textiles, and vegetable fibers. Victor monoammonium phosphate is used to prevent afterglow in matches.

**FROM FOOD TO FABRICS**

Victor ammonium phosphates are truly versatile compounds and improve many products and processes. They are applied successfully to the manufacture of many food products. Victor monoammonium phosphate is used as an ingredient in plant foods, as a cleaner and rustproofer of metals, and as an ingredient in glass and vitreous enamels. Victor diammonium phosphate is used in the formulation of ammoniated dentifrices, as a catalyst for urea and melamine resins, in the manufacture of chemicals, and in the dyeing of textiles.

**ATTENTION CHROME DYERS OF WOOL!**

Victor diammonium phosphate can save you as much as *four* hours in dyeing time . . . help you save on labor and production costs.

Victor diammonium phosphate is a unique and valuable chrome-dyeing assistant in that it provides the desirable initial pH which persists while the bath is brought to boil. Upon continued boiling, the pH falls gradually, allowing ample time for proper distribution of the dye.

*Victor diammonium phosphate prevents wide fluctuations in pH, promotes unusual levelness, and makes chrome dyeings more easily reproducible.*

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A good look at the information on the following page could be your first step in finding something new for your company. There is that possibility. Experimental samples and additional information on Victor ammonium phosphates are available. Mail the coupon. Our research and development staff welcome the opportunity to work with you. Please attach the coupon to your company letterhead.

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(*U.S. Pat. 2122122)

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- ☐ Sample of Fyrex®
- ☐ Sample of Special Flexible Fyrex®
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- ☐ Sample of Diammonium Phosphate (Chrome Dyeing Technical Bulletin)
- ☐ Sample of Flexible Fyrex®
- ☐ Sample of Victamide
- ☐ Victor Catalog

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# VICTOR FOOD-PURITY AMMONIUM PHOSPHATES

| | MONOAMMONIUM PHOSPHATE | DIAMMONIUM PHOSPHATE |
|---|---|---|
| Formula<br>Mol. Wt.<br>Spec. Gravity | $(NH_4)H_2PO_4$ Monoammonium Phosphate is a brilliant, white crystalline or powdered material meeting all U.S. Pure Food Law requirements.<br>115.08<br>1.803 | $(NH_4)_2HPO_4$ Diammonium phosphate is a brilliant white crystalline or powdered product complying with all U.S. Pure Food Law requirements.<br>132.07<br>1.619 |
| Typical Analysis | Phosphorus Pentoxide ($P_2O_5$).....61.3%<br>Ammonia ($NH_3$).....14.6%<br>Sulfate ($SO_3$)..... 0.02<br>Iron (Fe).....35.0 ppm<br>Fluorine (F)..... 2.5 ppm<br>Arsenic Oxide ($As_2O_3$)..... 0.2 ppm<br>Lead (Pb)..... 0.3 ppm<br>pH (1% solu.)..... 4.5 | Phosphorus Pentoxide ($P_2O_5$).....53.5%<br>Ammonia ($NH_3$).....25.2%<br>Sulfate ($SO_3$)..... 0.06%<br>Iron (Fe).....38.0 ppm<br>Fluorine (F)..... 1.6 ppm<br>Arsenic Oxide ($As_2O_3$)..... 0.1 ppm<br>Lead (Pb)..... 0.3 ppm<br>pH (1% Solu.)..... 8.0 |
| Granulation | Regular—All through 10 mesh<br>Powdered 99% Powdered Monoammon. Phos. substantially all through 100 mesh. 1% Tricalc. Phosphate as conditioner. | Regular—Substantially all through 10 mesh.<br>Powdered FF—Substantially all through 100 mesh.<br>(Powdered Diammonium Phosphate contains 0.5% Tricalc. Phos. as conditioner.) |
| Solubility | Grams. $NH_4H_2PO_4$ per 100 grams of:<br>T° C. / Sat. Sol. / Water<br>0 / 18.5 / 22.7<br>10 / 22.8 / 29.5<br>20 / 27.2 / 37.4<br>30 / 31.7 / 46.4<br>40 / 36.2 / 56.7<br>60 / 45.2 / 82.5<br>80 / 54.2 / 118.3<br>100 / 63.4 / 173.2<br>110.5 / 68.3 / 215.0 | Grams $(NH_4)_2HPO_4$ per 100 grams of:<br>T° C. / Sat. Sol. / Water<br>0 / 30.0 / 42.9<br>10 / 38.6 / 62.8<br>20 / 40.8 / 69.0<br>30 / 42.9 / 75.2<br>40 / 45.0 / 81.8<br>50 / 47.2 / 89.2<br>60 / 49.3 / 97.3<br>70 / 51.4 / 106.0 |
| Uses | Flameproofing of paper, textiles, wood and vegetable fibers. Prevents afterglow in matches. An ingredient of plant nutrients. Manufacture of yeast, vinegar, yeast foods, bread improvers. As an acid cleaner and rust-proofer for metals. As an ingredient in glass and vitreous enamels. | Its flameproofing properties and uses are similar to those for monoammonium phosphate. In the formulation of ammoniated dentifrices. To control the pH of soda crackers—U.S. Pat. 2288118. As a catalyst for urea and melamine resins. As a buffer in the chrome dyeing of wool. In the manufacture of high purity calcium phosphates for use in phosphors. |
| Availability | Commercial Quantities. | Commercial Quantities |
| Packages | Multiwall Paper Bags—100 pounds net. | Multiwall Paper Bags—100 pounds net. |

| | % Monoammon. Phosphate | % Diammon. Phosphate | pH of 0.5% Solu. |
|---|---|---|---|
| Buffering Solutions | 100 | 0 | 4.5 |
| | 80 | 20 | 6.2 |
| | 60 | 40 | 6.6 |
| | 40 | 60 | 6.9 |
| | 20 | 80 | 7.2 |
| | 0 | 100 | 8.0 |

VICTOR
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**VICTOR CHEMICAL WORKS**
141 West Jackson Boulevard, Chicago 4, Illinois
A. R. Maas Chemical Co., Division
4570 Ardine Street, South Gate, Calif.

**Fyrex®** is a substantially neutral phosphate of ammonia in fine crystalline form.

**Flexible Fyrex®** is also a neutral product to which a variety of softening agents has been added to prevent material from adhering to drying rolls, plates, or forms, and to preserve flexibility of materials.

**Special Flexible Fyrex®** provides rapid penetration of its solution for materials which are difficult or slow to wet and in addition preserves the flexibility of the treated materials by inhibiting the crystallization of ammonium phosphate.

**Solubility:** Approximately 54 parts in 100 parts saturated solution at 26.5° C.

**Uses:** Flameproofing of textiles, paper, wood, vegetable fibers. Applied to paper, fabrics, or insulating materials by dipping, spraying, or contact rollers; to wood under pressure in autoclaves.

**Containers:** 100 lb. paper bags

When inquiring check CP 5886 on handy form, pgs. 2-3


phytol in reactions involving the phytyl radical. Molecular rearrangement occurs and the OH shifts to the final carbon as in phytol.

**Description:** Isophytol is a 20-carbon chain alcohol being offered in research quantities at present. Physical standards submitted by manufacturer include:

| | Range | Usual |
|---|---|---|
| Boiling point, °C (0.1 mm pressure) | 125-135 | 125-127 |
| Boiling point, °C (0.2 mm pressure) | 140-150 | 140-142 |
| Density @ 15°C | 0.843-0.844 | 0.8434 |
| Refractive index @ 20°C | 1.4555-1.4565 | 1.4548 |

(Manufactured by Charles Bowman & Company, Dept. CP, 220 East 42nd St., New York 17, N. Y. . . . or for more information check CP 5887 on handy form, pages 2 and 3.)

### *Announce bacteriostat for soap, similar products*

Commercial availability of a non-irritating bacteriostat (Actamer) for deodorant soap and similar products has been announced by the Monsanto Chemical Company. The product is reported to be retained on the skin in minute amounts necessary to provide sustained effectiveness against the bacteria responsible for body odors and for many skin disorders.

Controlled hand-washing tests using soap containing very small percentages of the bacteriostat show a reduction of resident skin bacteria of more than 97.5%. The product is especially effective in the presence of soap against gram-positive cocci. It is expected that Actamer will be used in shampoos, shaving creams, and other cosmetics.

Technically, the product is 2,2′-thiobis (4,6-dichlorophenol), a white to light tan crystalline solid. Its stability compares favorably with similar products. Odor ranges from nil to very faintly aromatic.

(Toxicological, chemical, and antimicrobial information is available from Monsanto Chemical Company, Dept. CP, St. Louis 4, Mo. . . . or for more information check CP 5888 on handy form, pages 2 and 3.)

### *Polyvinyl stabilizer inhibits exudation of plasticizer*

A stabilizer designed to inhibit plasticizer exudation from polyvinyl resins is announced in four-page booklet. Properties and applications of the product are presented in question-and-answer style.

Stabilizer is quadruple-purpose compound. It is reported to: 1) stabilize against heat degradation, 2) protect against light attack, 3) stabilize against plasticizer exudation, and 4) lubricate during processing. Tendency of oil-type plasticizers toward spewing is inhibited by stabilizer.

Information on properties and formulations is included. Purposes and specifications are summarized. Table of plasticizers rates five ricinoleates and three acetoxystearates according to volatility, brittle point, exudation resistance, heat resistance, light resistance, and water sensitivity when used with the stabilizer.

"Staycin 1" is issued by The Baker Castor Oil Company, Department CP, 120 Broadway, New York 5, New York. When inquiring specify CP 5889 on handy form, pages 2 and 3.



PUT UP TO 6 TIMES MORE SOLIDS INTO SUSPENSION WITHOUT INCREASING VISCOSITY WITH

MARASPERSE

THE *low cost,* MORE EFFECTIVE DISPERSANT

Without Marasperse only a 6% suspension of water-insoluble pigment can be maintained in a fluid condition.

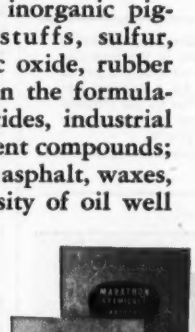
With the addition of a small amount of Marasperse, a 43% fluid suspension of pigment is maintained with no increase in viscosity.

Marasperse deflocculates insoluble particles in water suspension and prevents agglomeration.

1. Viscous pasty masses become thin free-flowing fluids.
2. Settling of suspended solids is prevented or greatly retarded.
3. Slurries are kept fluid even with greatly increased concentration of solids.

Marasperse is used in making dispersions of organic and inorganic pigments, insoluble dyestuffs, sulfur, clay, gypsum, carbon black, zinc oxide, rubber antioxidants; as grinding aids; in the formulation of wettable powder insecticides, industrial cleaners, boiler feedwater treatment compounds; to stabilize hot-melt emulsions of asphalt, waxes, and resins; for controlling viscosity of oil well drilling muds.

Marasperse dispersants are non-hygroscopic, free-flowing powders — completely soluble in water.



Write for information on MARASPERSE products. You will receive complete and specific technical data. Our research staff will welcome the opportunity to cooperate with you.

MARATHON CORPORATION

CHEMICAL DIVISION

ROTHSCHILD • WISCONSIN

When inquiring check CP 5890 on handy form, pgs. 2-3




***Offering research quantities of hexahydrophthalic anhydride . . .***

viscous liquid's derivatives useful in plastics, rust inhibitors, insecticides, and insect repellents

**Uses:** Derivatives of this compound may be used as: 1) plasticizers in molding and coating compositions such as those of cellulose derivatives, synthetic resins or rubber derivatives, 2) safe insect repellents, 3) part of rust inhibiting compounds for metallic surfaces, and 4) synergists with pyrethrum when used against the body louse.

**Description:** Hexahydrophthalic anhydride (cis-1,2-cyclohexanedicarboxylic anyhydride) is a clear, colorless, viscous liquid that freezes to a glassy solid at 35 or 36°C, boils at 158°C at 17 mm abs, and has a density of 1.19 gm/ml at 40°C. It has 99% minimum total acidity as hexahydrophthalic anhydride, and is miscible with benzene, toluene, acetone, carbon tetrachloride, chloroform, ethanol, and ethyl acetate, but is only slightly soluble in petroleum ether.

The compound reacts with boiling water to form cis-hexahydrophthalic acid, which has a melting point of 190-191°C. It reacts readily with absolute ethanol in the presence of sulfuric acid to form diethyl hexahydrophthalate. The anhydride also reacts with aniline in benzene solution to form the monoanilide, and with benzene and aluminum chloride to form 2-benzoylcyclohexanecarboxylic acid.

Cis-hexahydrophthalic anyhydride decomposes at about 380°C with evolution of carbon dioxide, forming a mixture of products, including anthraquinone, dodecahydroanthraquinone, and hydrogenated anthracene.

Currently available in research quantities, the compound has as yet shown no particular hazards in handling. Physiological characteristics are not yet known.

(Made by National Aniline Division, Allied Chemical & Dye Corporation, Dept. CP, 40 Rector St., New York 6, N. Y. . . . or for more information check CP 5891 on handy form, pages 2 and 3.)

***Comprehensive booklet reviews soda bleach solutions***

Preparation of sodium hypochlorite and correlated data are features of 44-page booklet. Material presented will be of interest to chemical processing, textile, paper, and petroleum industries among others.

General properties of hypochlorites are described. Five major factors governing stability of solutions are discussed. Section dealing with preparation outlines calculations of chlorine, caustic soda, and water needed to produce solution of any desired concentration. Thirteen tables are included, among these charts listing quantities of materials and ice required to make 1000 gallons of stable soda bleach solution.

Booklet reviews refrigeration requirements, analytical methods for chemical control, and necessary solution preparation equipment. Four sectional diagrams illustrate typical installations of hypochlorite plants and show details of construction.

"Diamond Soda Bleach Solutions" is issued by Diamond Alkali Co., Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio. When inquiring specify CP 5892 on handy form, pages 2 and 3.




WANT TO PRODUCE 50% MORE, TOO?

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SOLKA®-FLOC

***Here's why:***

Because of its *unusually high density* SOLKA-FLOC allows you to get 50% more alkali cellulose into your reactor than do other forms of cellulose. The result? Greater production through savings in both labor and equipment.

You'll discover, too, that when used in making cellulose derivatives, SOLKA-FLOC *reacts far faster* and is *much easier to handle* than other forms of cellulose.

Learn more about how this versatile product might help you. Write today to Dept. BF-11 at Boston.

*Prompt shipment guaranteed—pounds to carloads.*

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When inquiring check CP 5893 on handy form, pgs. 2-3

***Gives more flexibility, wrinkle resistance to fibers . . .***

50% non-ionic wax will not leach on washing

**Uses:** As a fiber lubricant and added to the resin bath. Depending upon further mechanical procedure, will also give smoothness to fabric and furnish lubrication to friction and schriener calender rolls.

**Features:** After cloth is cured, the fabric is more flexible with increased wrinkle resistance and superior sewability because of the lubricants that have become an inherent part of the cloth due to the resin binder. Product is tied in the cloth with the resin and will not leach on washing.

**Description:** Silver-Lube R.L. is a 50% non-ionic micro-crystalline wax emulsion; has a pH of 6. It is compatible with gums, starches, urea and melamine formaldehyde resins; also compatible with polyvinyl alcohol and acetate coatings.

Possible recommended amount — 1 to 3% depending on the weight of the total mix.

(Silver Lube R.L. is a product of The Carolina Aniline & Extract Co., P.O. Box 2386, Charlotte 1, N. C. . . . or for more information check CP 5894 on handy form, pages 2 and 3.)

***Faster dissolving — free-flowing form of penta***

A free-flowing form of pentachlorophenol — said to be less dusty, lower in odor, and faster dissolving than pentachlorophenol flakes — is now available in commercial quantities from Monsanto Chemical Company. The material is in the form of irregularly shaped pellets ranging downward in size from one-eighth inch.

Penta is a widely used wood preservative and herbicide. Monsanto also offers an oiled grade of penta that is said to dissolve in one-third to one-half the time required for the regular flaked material.

(Monsanto Chemical Company, Dept. CP, St. Louis 4, Mo. . . . or for more information check CP 5895 on handy form, pages 2 and 3.)

**For more information on product at right, specify CP 5896 . . . see information request blank between pages 2-3.**


NEW LIGHT ON AN OLD SUBJECT*

Bringing new light to bear on the varied uses of

its products is part of Niagara's service to industry.

NIALK® Carbonate of Potash

This potash salt is finding increasing favor in the development and production of special dyes for the textile industry, since its carefully controlled purity and quality are particularly helpful in achieving and maintaining a true color.

Quality plus cooperation keeps NIALK products at the forefront in research and product improvement.

NIAGARA ALKALI COMPANY

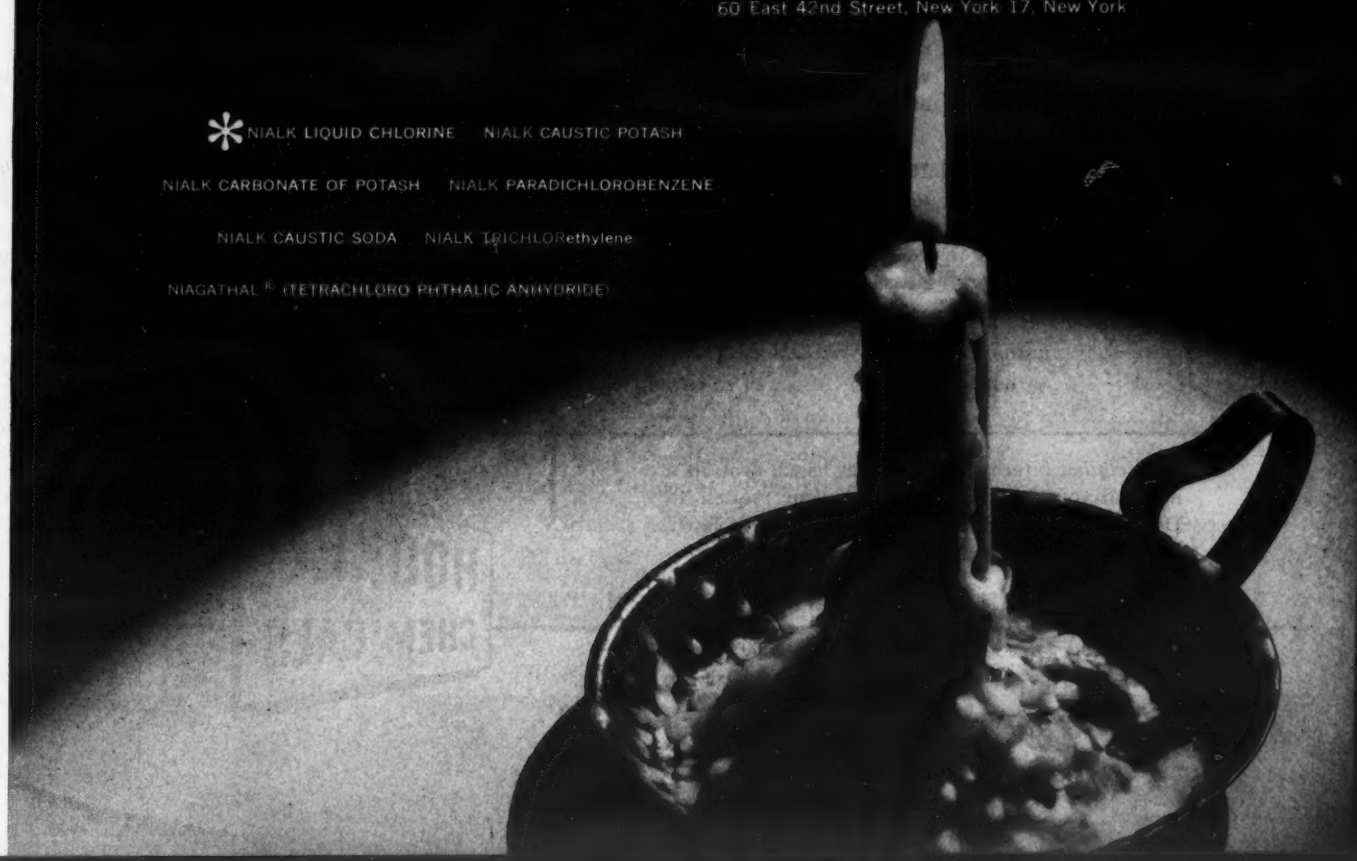
60 East 42nd Street, New York 17, New York

*NIALK LIQUID CHLORINE NIALK CAUSTIC POTASH

NIALK CARBONATE OF POTASH NIALK PARADICHLOROBENZENE

NIALK CAUSTIC SODA NIALK TRICHLORethylene

NIAGATHAL® (TETRACHLORO PHTHALIC ANHYDRIDE)

**Hooker Chemical Guide**
(ONE OF A SERIES)
USE this handy reference to save time in selecting high quality chemicals.

HOOKER
# SODIUM BENZOATE
# BENZOIC ACID

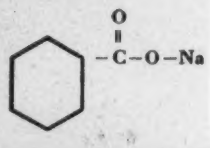
**A GRADE TO FIT YOUR NEEDS, USP OR TECHNICAL**

## SODIUM BENZOATE USP and Technical

Synonym: Benzoate of Soda

Formula: $C_6H_5COONa$

Appearance: White, odorless, crystalline solid, sold in flake or powdered form.



**TYPICAL PROPERTIES**

USP GRADE

| | |
|---|---|
| Molecular Weight | 144.1 |
| Sodium Benzoate | 99+% |
| Benzoic Acid | 0.2% max. |
| Water | 0.5% max. |

Description: Meets all chemical and physical requirements of U.S. Pharmacopoeia XIV.

TECHNICAL GRADE

| | |
|---|---|
| Molecular Weight | 144.1 |
| Sodium Benzoate | 98% min. |
| Benzoic Acid | 0.4% max. |

Description: Does not quite meet the requirements of U.S. Pharmacopoeia XIV.

**USES**

Food Preservative: foods, fruit juices, syrups, margarine.

Antiseptic: pharmaceutical and cosmetic preparations, tooth paste.

Tobacco Curing

Corrosion Inhibitor: for glycol antifreeze solutions, solvent type metal cleaners, etc.

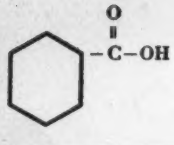
Chemical Intermediate: dyestuffs and pharmaceuticals.

## BENZOIC ACID USP and Technical

Synonyms: Benzenecarboxylic Acid
Phenylformic Acid

Formula: $C_6H_5COOH$

Appearance: White, crystalline solid, USP grade is available in powder form. Technical grade is available either in powder form or in the form of very small bead-like particles.



**TYPICAL PROPERTIES**

USP GRADE

| | |
|---|---|
| Molecular Weight | 122.1 |
| Benzoic Acid | 99.3% min. |
| Water Content | 0.2% max. |

Description: Meets all chemical and physical requirements of U.S. Pharmacopoeia XIV.

TECHNICAL GRADE

| | |
|---|---|
| Molecular Weight | 122.1 |
| Benzoic Acid | 98.0% min. |
| Water Content | 0.2% max. |

Description: Does not quite meet the chemical and physical requirements of U.S. Pharmacopoeia XIV.

**USES**

Chemical Intermediate: dyestuffs, perfumes, pharmaceuticals, benzoates, flattening agents for paint.

Preservative: for textile sizing, foods, cosmetic creams, lotions.

Antiseptic: for dentifrices and pharmaceuticals.

Tobacco Curing

Dyeing Assistant: for polyglycol terephthalate fibers (Dacron). Benzoic acid has a swelling effect on some of the new synthetic fibers. This gives better dye penetration with resulting level, long lasting color.

*For detailed information* on items listed, drop us a note on your letterhead. Address your request to HOOKER ELECTROCHEMICAL COMPANY, 15 Forty-Seventh Street, Niagara Falls, N. Y.

**HOOKER ELECTROCHEMICAL COMPANY**

NIAGARA FALLS, N. Y. • NEW YORK, N. Y.
TACOMA, WASH. • CHICAGO, ILL. • WILMINGTON, CALIF.

*From the Salt of the Earth*

HOOKER® CHEMICALS

2-326

When inquiring check CP 5897 on handy form, pgs. 2-3


### *High plasticizing efficiency and low temp flexibility in polymeric . . .*

retains easy handling properties of lower mol wt monomeric plasticizers

**Uses:** Plasticizer for general vinyl compounding. It is recommended for use in compounds coming into contact with oil, gasoline and water, and compounds subject to outside weather conditions.

Its high heat resistance suggests its possible use in Underwriters wire and cables, industrial tubing, gaskets, and grommets, etc. It is highly satisfactory in calendering and extruding operations.

**Features:** Clear, light in color and low viscosity. Retains the easy handling of the lower molecular weight monomeric plasticizers. Gives high plasticizing efficiency, despite its polymeric nature, plus good low temperature flexibility. Excellent resistance to heat and light aging.

**Description:** DP-250 is a polyester plasticizer. It is soluble in acetone, ethyl alcohol, ethyl acetate, carbon tetrachloride, chloroform and partially soluble in ether. It is insoluble in water and aliphatic hydrocarbons.

It offers low migration and low heat loss. Some of its properties are tabulated below:

| | |
|---|---|
| Specific gravity @ 250°C | 1.03 |
| Weight per gallon, lb | 8.57 |
| Color (Gardner) | 4 (max) |
| Acid number | 4 (max) |
| Viscosity @ 20°C, cp | 400-450 |
| @ 30°C, cp | 240-280 |
| Congealing temperature (approx), °C | −10 |
| Flash point, °F | 475 |
| Fire point, °F | 510 |
| Refractive index @ 20°C | 1.4582 |

(Additional details on DP-250 may be obtained from E. F. Drew & Co., Inc., Dept. CP, 15 East 26th St., New York 10, N. Y. . . . or for more information check CP 5898 on handy form, pages 2 and 3.)

### *Variety of fortified coatings possible with vinyl resin*

Information on basic properties and suggested uses of modified vinyl chloride acetate copolymer is contained in 16-page pamphlet. Several features and properties of compound will be of great interest to formulators of coatings.

Chemical composition and several physical properties are discussed. Characteristics of solubility, compatibility with other materials, softening point, plasticization, moisture resistance, heat and light stability, pigmentation, application, adhesion, and insolubilization are reviewed. Tables are presented to summarize qualitative solubility of resin in various solvents, compatibility with various commercial resins, and properties of several alkyd resins fortified with the vinyl copolymer.

Uses of resin in metal finishes, container coatings, adhesives, fortified coatings, paper coatings, and other products are described. Suggested formulations are given in several cases.

"Vinylite Resins — Technical Release No. 6" is issued by Bakelite Company, a Division of Union Carbide and Carbon Corporation, 300 Madison Ave., New York 17, N. Y. When inquiring specify CP 5899 on handy form, pages 2 and 3.

***Zirconium-based drier imparts glass-like hardness . . .***

can be used to partially replace cobalt and manganese

**Uses:** Drier for hardening paint films. Can replace up to 40% of the cobalt used in conventional oleoresinous finishes and up to 60% of the manganese used.

Will replace lead as a bottom drier for the formulation of fumeproof finishes.

**Features:** Above substitutions can take place without any impairment of drying efficiency. It imparts improved gloss with reduced hazing in alkyds and greatly increased film adhesion without embrittlement.

**Description:** Advance Zirco Drier Catalyst is basically a zirconium chemical complex in mineral spirits solution and contains a standardized metal content of 6% zirconium metal. It contributes noticeable increased hardness after overnight dry with a glass-like hardness being developed after 96 hr.

When used to replace a portion of the regularly employed manganese dosages, resulting films are better in color, generally equal in drying speed and dust free quality, and improved in Sward hardness.

(A product of Advance Solvents & Chemical Corp., Dept. CP, 245 Fifth Avenue, New York 16, New York . . . or for more information check CP 5900 on handy form, pages 2 and 3.)

***Reviews prop's, uses of liquid polymer***

Colorful folder describes characteristics and suggested applications of material which changes to tough, solvent-resistant rubber at normal working temperatures.

Photographs illustrate eight representative applications for material. Summary of physical properties is included. Typical formulation and properties of resulting compound are reported.

Folder describing "Thiokol" Liquid Polymer, LP-2, is issued by Thiokol Corp., Dept. CP, 784 N. Clinton Ave., Trenton, N. J. When inquiring specify CP 5901 on handy form, pages 2 and 3.

**For more information on product at right, specify CP 5902 . . . see information request blank between pages 2-3.**





Consider these features offered by Heyden Pentek in the manufacture of fine surface coatings:

- – Proved performance based on years of leadership.
- – Dependable uniformity through rigid laboratory control.
- – Increased availability through Heyden's expanded production.
- – Economy of time and materials in resin production.
- – Superior durability and beauty of finished paint.

If you are making alkyd resins, rosin esters, tall oil esters or drying oils, PENTEK gives them the extra quality you are looking for.

When you formulate with PENTEK, your paints, varnishes, lacquers and enamels have tougher films, increased color and gloss retention, and added resistance to alkali, water and weathering.

Specify PENTEK with confidence! It's made to fill your needs by Heyden, pioneer producer of pentaerythritols. Technical facts, figures and samples available promptly upon request.

PENTEK is packed in easy-to-handle, strong multi-wall paper bags, 80 lbs. net.




**HEYDEN CHEMICAL CORPORATION**

**342 Madison Avenue, New York 17, N.Y.**

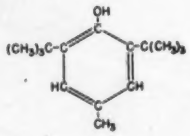
CHICAGO • PHILADELPHIA • SAN FRANCISCO • DETROIT • PROVIDENCE

# DBPC

## Di-tert-BUTYL-para-CRESOL

## is a highly-effective antioxidant

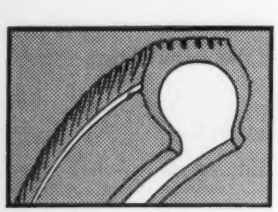
• Koppers 2, 6 Di-tert-butyl-para-cresol (DBPC) is a crystalline, tri-alkylated phenol, easily soluble in common organic solvents. Being a hindered phenol, it undergoes few of the reactions typical of unhindered phenols, such as phenol and meta-cresol.



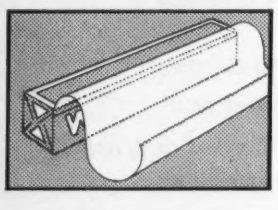
Koppers DBPC is an oxidation inhibitor that is non-staining and non-corrosive; it is insoluble in aqueous solutions of acids or alkalis. For the rubber, petroleum and waxed paper industries, DBPC has proved its value as a highly-effective antioxidant.

**FOR FURTHER INFORMATION,** write for your copy of Bulletin C-0-115. It describes in detail the properties, reactions and uses of DBPC.

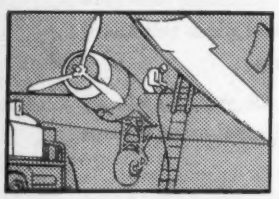
*in these fields*



**RUBBER** DBPC is useful as a "non-coloring" and a "non-staining" rubber antioxidant because it causes little or no discoloration of white or light-colored rubber products, even after prolonged exposure to light, heat and air.



**WAXED PAPER** Fractional percentages of DBPC (0.01 to 0.05) in the wax bath retard oxidation and increase stability of color and odor. DBPC greatly increases the life of wax even at temperatures up to 300°F.



**PETROLEUM** DBPC is an excellent antioxidant for high-grade lubricating oils for low-temperature service such as spindle oils, greases, waxes, etc., and for such oils as turbine oils and transformer oils. In these oils, it inhibits the formation of gums and acidic products which are formed due to oxidation.

It is also one of the most effective inhibitors for the reduction of gum formation in aviation gasolines, where it is important to effect the inhibition without the production of undesirable deposits of residues in carburetors.

*Write to Dept. CP-112 for your copy of Bulletin C-O-115.*

KOPPERS

KOPPERS COMPANY, INC.

*Chemical Division*

Koppers Building, Pittsburgh 19, Pa.

When inquiring check CP 5903 on handy form, pgs. 2-3



***Speeds grinding and mixing of colors, pigments . . .***

makes possible savings of up to 50% in mixing time

**Uses:** Pigment wetter and dispersant for paints, enamels, printing inks, putty and caulking compounds.

**Features:** Product makes possible a thorough dispersion of pigment within a uniformly wet mass at up to 50% savings in mixing time. Pastes can be prepared with higher pigment concentrations while maintaining the proper consistency for the type of mill used, assuring maximum mill output at low grinding cost per gallon.

When used with paints it retards hard settling, controls sagging and running, overcomes silking and flooding. Through more thorough wetting and better dispersion, it tends to intensify and develop color strength and increase the floss of films.

**Description:** Tenlo-70 is a 100% active, non-ionic surface active agent. It is an amber colored, free-flowing liquid with a specific gravity of 0.988 at 60°F.

It is soluble or miscible in vehicles and thinners normally employed including raw, bodied and blown oils; petroleum, aromatic, ester, and ketone type solvents; phenolic, maleic and penta type varnishes and alkyds.

Tenlo-70 does not affect the viscosity or drying time, and tests indicate that it has no effect on the weathering characteristics of paint films.

(Product of the Griffin Chemical Co., Dept. CP, 1000 Sixteenth St., San Francisco, Calif. . . . or for more information check CP 5904 on handy form, pages 2 and 3.)

***Rugged plastic made in many forms***

Pipe molding, extrusions, and fabrications produced from a recently developed plastic material are described in handy booklet. Plastic material has toughness and high impact strength, but does not sacrifice stiffness. Product is a compounded material, so formulation and processing can be varied to produce different properties within a considerable range.

Booklet describing "Indestructible" plastic is issued by New York Belting and Packing Co., Dept. CP, 1 Market St., Passaic, N. J. When inquiring specify CP 5905 on handy form, pages 2 and 3.



# WRITE TODAY FOR DATA ON DU PONT "TEFLON"*



For gaskets, packing and other equipment for the process industries, "Teflon" offers this unusual combination of properties . . .

- **CHEMICAL INERTNESS** — inert to all chemicals except molten alkali metals, and fluorine under extreme conditions.
- **HEAT RESISTANCE**—capable of continuous service up to 500°F.
- **LOW TEMPERATURE TOUGHNESS** —used at temperatures as low as -320°F.
- **EROSION RESISTANCE**—resists erosion by impinging fluids.
- **LOW COEFFICIENT OF FRICTION**
- **ANTI-ADHESIVE PROPERTIES**—nothing sticks to "Teflon" with any appreciable strength.

The Du Pont Polychemicals Department supplies "Teflon" in the forms of molding powder and aqueous dispersions. We'll gladly suggest names of molders and fabricators of sheets, rods, tubes and finished parts. For full information, write: E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department; District Offices: 350 Fifth Avenue, New York 1, N.Y.; 7 S. Dearborn Street, Chicago 3, Ill.; 845 E. 60th Street, Los Angeles 1, Calif.

**Trademark for Du Pont tetrafluoroethylene resin*

DU PONT

Reg. U.S. Pat. Off.

150th Anniversary

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

When inquiring check CP 5906 on handy form, pgs. 2-3



# LINED drums carry many more chemicals . . . stand more trips





The right drum lining for your product can do two things for you. (1) Prevent corrosion—and consequent contamination and waste of production. (2) Last longer so as to permit reuse of container without relining.

In Unichrome Drum Linings, you get the *right* coating for an evergrowing list of familiar as well as newly developed and chemically processed products. Such as: synthetic wetting agents and detergents . . . alcohols . . . vinyl latex solutions . . . chromic acid . . . edible oils . . . bleaches . . . benzene . . . food products . . . and many more. Check us about your requirements in a lining.

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Chicago 4, Ill. • Los Angeles 13, Calif. • In Canada: United Chromium Limited, Toronto, Ont.

When inquiring check CP 5907 on handy form, pgs. 2-3

### *Soap extending value good for latex stabilizer-emulsifier*

**Uses:** May be used as an emulsifier in the preparation of "cold" rubber latices, and as a stabilizer for natural and synthetic latices or latex formulations including foam rubber, adhesives, etc. Reported of value as a soap extender.

**Features:** Cold rubber latices are fluid and stable, and cannot be coagulated with salt and acid, but are readily coagulated with alum. Superior adhesives are said to be obtained from synthetic rubber latex.

Value as a soap extender is apparent from consideration of the soap requirements in low temperature polymerizations. Satisfactory, reproductible rates of polymerization are obtained by using 2-3 parts of sodium soap flakes and 1 part of this emulsifier-stabilizer. Ordinarily, in low-temperature polymerizations, 4-5 parts of potassium salt or 5 parts of stabilized rosin acid soap (potassium soap on 100% basis) are required.

**Description:** Emcol K-8300 is an anion-active fatty amide derivative furnished as an aqueous concentrate. It is stable in concentrated or dilute solutions at pH 4-7.

Heating at these pH values does not destroy the effectiveness of the emulsifier. It is not stable for prolonged contact, or at elevated temperatures above pH 7.0 or below pH 4.0. It is, however, stable at room temperature for a short period of these pH values.

Moderate solubility is shown in solutions of electrolytes, aqueous solutions of ethanol, ethylene glycol, acetone, etc. Insolubility is maintained in fats, oils, hydrocarbons, and chlorinated hydrocarbons. Properties are tabulated below:

EMCOL K-8300 LATEX STABILIZER & EMULSIFIER

| | |
|---|---|
| Total solids, % | 39-40 |
| Active ingredients, % | 33-35 |
| Inorganic salts, % | <2 |
| pH range of 1% solution | 5.0-6.3 |
| Surface tension of 1% solution at 25°C, dynes/cm | 35-36 |
| Color | amber |
| Form | liquid |
| Weight per gallon, lb | 9.17 |

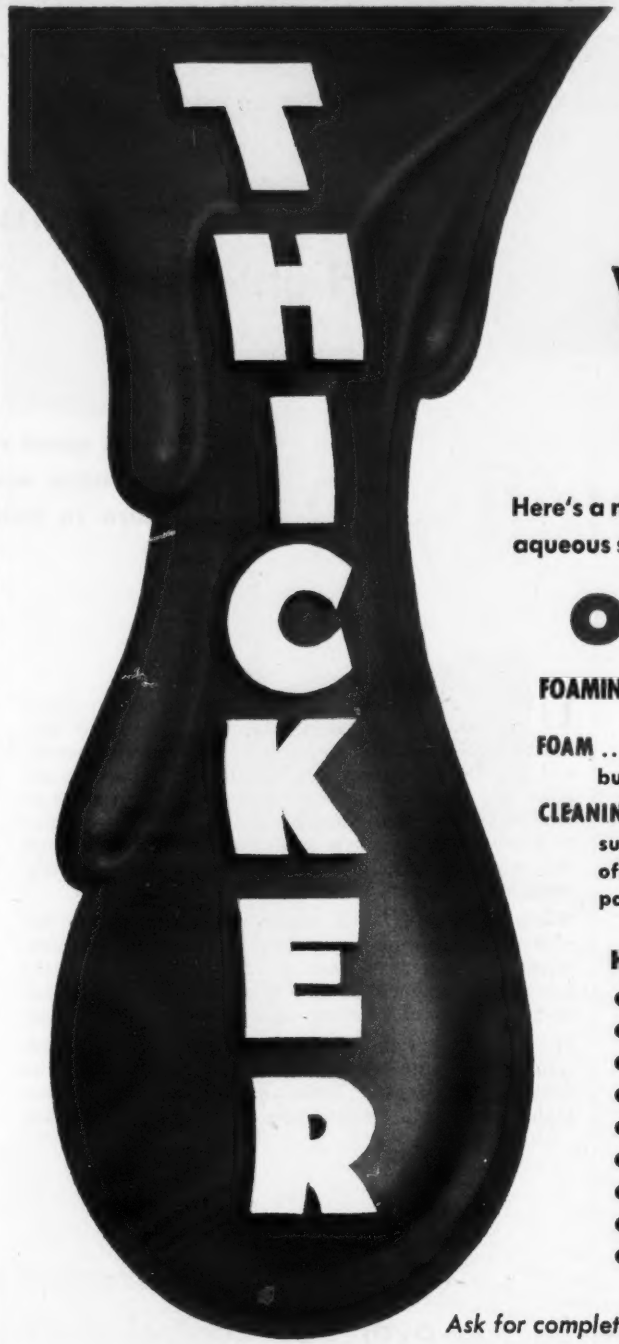
(Product of The Emulsol Corporation, Dept. CP, 59 East Madison St., Chicago 3, Ill. . . . or for more information check CP 5908 on handy form, pages 2 and 3.)

### *Revised catalog includes over 3500 compounds*

Comprehensive 38th edition of catalog lists over 3500 organic chemicals. Total of 256 compounds has been added to listing subsequent to last edition.

In addition to listing individual chemicals catalog includes information on purity classifications, formulas and molecular weights, package sizes, specifications, and related topics. Special reagents for specific analytical procedures, special spot test reagents, alkaloids, indicators, sugars, amino acids, carcinogenic hydrocarbons, stable isotope concentrates of carbon and nitrogen, liquids for refractive index determinations, vitamins and related products, and other special categories are listed in separate sections of this catalog.

List No. 38 is issued by Distillation Products Industries, Div. of Eastman Kodak Co., Dept. CP, Rochester 3, N. Y. When inquiring check CP 5909 on handy form, pages 2 and 3.


Do you want to maintain or add VISCOSITY in your product?

Here's a non-ionic detergent that exhibits high viscosity in aqueous solutions. It thickens without the use of additives.

ONYXOL 336

FOAMING • WETTING • DISPERSING • EMULSIFYING AGENT

FOAM ... Onyxol 336 provides copious, highly stable, SMALL bubble foam.

CLEANING ACTION ... Highly effective for both hard and soft surfaces. Onyxol emulsifies most common oils. It rinses off easily with unusually good drainage action. It is particularly valuable on dishes and glassware.

HERE ARE A FEW EFFECTIVE USES:

- Wettable Sulfur
- Foaming Fire-fighting Solutions
- Ore Flotation Solutions
- Household Liquid Detergents
- Industrial Cleaners
- Shampoos ... Bubble Bath Solutions ... Cosmetics
- Buffing and Polishing Compounds
- Pigment Mixing
- Polishes

*Ask for complete data . . . and for test samples, if you wish.*

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In Canada: Onyx Oil & Chemical Co., Ltd., Montreal, Toronto, St. Johns, Que. For Export: Onyx International, Jersey City 2, N. J.
West Coast Representative: E. S. Browning Co., San Francisco, Los Angeles

When inquiring check CP 5910 on handy form, pgs. 2-3

PETRONATE*
(Oil Soluble)

HYPONATE*
(Oil Free)

PYRONATE*
(Water Soluble)

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SULFONATES

. . .made to your specifications
for use in products such as. . .

- rust preventive formulations
- soluble cutting oils
- soluble textile oils
- emulsion degreasing compounds
- fuel oil additives
- emulsifiers for agricultural and insecticide sprays
- special emulsifying formulations

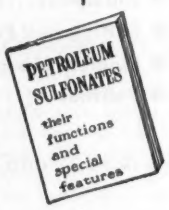
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Sonneborn petroleum sulfonates — superior in quality and possessing exceptional uniformity — are now made to fit a wide variety of specific needs. They can also be tailor-made to your exact specifications. You can rely on prompt shipment.

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RESEARCH

When inquiring check CP 5911 on handy form, pgs. 2-3



# Clarity, Pigment Inertness Big Highlights of Coating Resin

**Report good resistance to discoloration under severe conditions of exposure to heat, weather, chemicals**

USES: Suggested for a variety of specialty coatings on metal, wood, fabric, and plastic sheet and film. Crystal clarity makes it particularly attractive for novelty and decorative coatings on silverware, brass, chrome plate, etc. In these applications it can be used alone or modified with other film formers such as vinyl resins or nitrocellulose. It acts as a plasticizer for both vinyl and nitrocellulose, but additional plasticizers (polymeric or monomeric) can be used in combination.

When pigmented, it is suggested as the vehicle for white enamels where color retention at high temperatures is important. Resin is said to be an excellent vehicle for luminescent and fluorescent pigments used in production of glowing safety signs, novelties, etc.

Features: Acryloid B-82 is now supplied as 100% solids. Previously, the product was only available as 40% solids in toluol. Films are reported to have very high resistance to discoloration under severe conditions of exposure to weather and chemicals such as alkalis, acids, and chemical fumes. Resin itself is stable to practically all pigments including the sensitive luminescent and fluorescent types.

Description: Acryloid B-82 100% is a water-white, solid acrylic polymer. It does not have a sharp melting point, instead it softens in the range 70-80°C and flows at 140-155°C. Solubility is shown in toluol, xylol, and other aromatics. It can be put into solution using conventional tumbling barrels, pebble mills, or shellac cutting equipment. For laboratory work, it can be dissolved conveniently in jar mills or in cans or bottles placed on rotating mills.

(Further technical information, including formulations, is available from Rohm and Haas Company, Dept. CP, Washington Square, Philadelphia 5, Pa. . . . or for more information check CP 5912 on handy form, pages 2 and 3.)

# 80 ppm of experimental fungicide gives over 90% control of blight of apple and tomato

**Field tests show that product also prevents early blight of celery, as well as apple scab**

ACCORDING to the results of greenhouse and 1952 field studies, just released, Ethyl Corporation's Experimental Fungicide B-622 would appear to offer definite advantages . . . at least for early and late blight of tomato and potato, apple scab, and early blight of celery. Preliminary observation indicates that the fungicide also has value in controlling dollar spot and Helminthosporium of turf.

In the greenhouse, on early blight of both tomato and potato, a dosage of 80 ppm consistently gave better than 90% control (1200 ppm is roughly equivalent to 1 lb of active ingredient per 100 gal of water). Often

a concentration as low as 16 ppm gave over 90% control. Approximately the same results were obtained in greenhouse tests on late blight of tomato and potato.

In field tests, B-622 applied to potato in Florida for 8 applications on a 6 to 7 day schedule held blight well in check:

POTATO LATE BLIGHT CONTROL AND YIELDS

| Treatment | Per 100 Gal Water | Average Percentage Disease 4/4/52 | 4/17/52 | 5/1/52 | Ave. Yield Lb/Plot |
|---|---|---|---|---|---|
| B-622 | 0.5 lb | Trace | 30.0 | 56.7 | 74.7 |
| B-622 | 1.5 lb | Trace | 11.7 | 41.7 | 78.2 |
| Untreated | —— | 18.3 | 50.0 | 81.7 | 52.3 |

Effectiveness of the fungicide for apple scab was studied at three field locations during the 1952 season. Results at two locations are shown in the table directly below. At the third location, B-622 at a dosage of 2 lb of 50% wettable powder per 100 gal of water gave fairly good control of scab on McIntosh when used on an 8 to 10 day schedule. Here, it controlled scab better than sulfur or the carbamates tested and, under these conditions of test, showed some action as an eradicant.

APPLE SCAB CONTROL

| Treatment | Per 100 Gal Water | Percentage Leaf Scab Location 1 | Location 2 |
|---|---|---|---|
| B-622 | 0.5 lb | 28 | 27.9 |
| B-622 | 1.5 lb | 3 | 6.8 |
| Untreated | —— | 86 | 75.1 |

In Florida, the fungicide gave excellent control of early blight on celery. Plots treated with as little as 1 lb of 50% wettable powder per 100 gal of water averaged 1.6% diseased. The standard (a copper compound) averaged 5.0% and the checks 46.6% diseased. Yields were upped correspondingly by treatment.

B-622 is 2,4-dichloro-6-(*o*-chloroanilino)-s-triazine. Its acute toxicity appears to be less than that for DDT. Phytotoxicity appears to be low also, because only on occasional greenhouse-grown tomato plants and on apple in the field was there any injury. The injury to tomato occurred only at high dosages (2 lb active ingredient per 100 gal water). Of the two reports of injury to apple, one was thought to be primarily due to the exceptional set of conditions prevailing (temperature over 90° for three days following application).

It is believed that improper formulation is responsible in part for the plant injury. Improved formulations are being prepared and will be available in 1953. These will have better plant retention and less phytotoxicity to apple. Possibly one of these will be an emulsifiable concentrate.

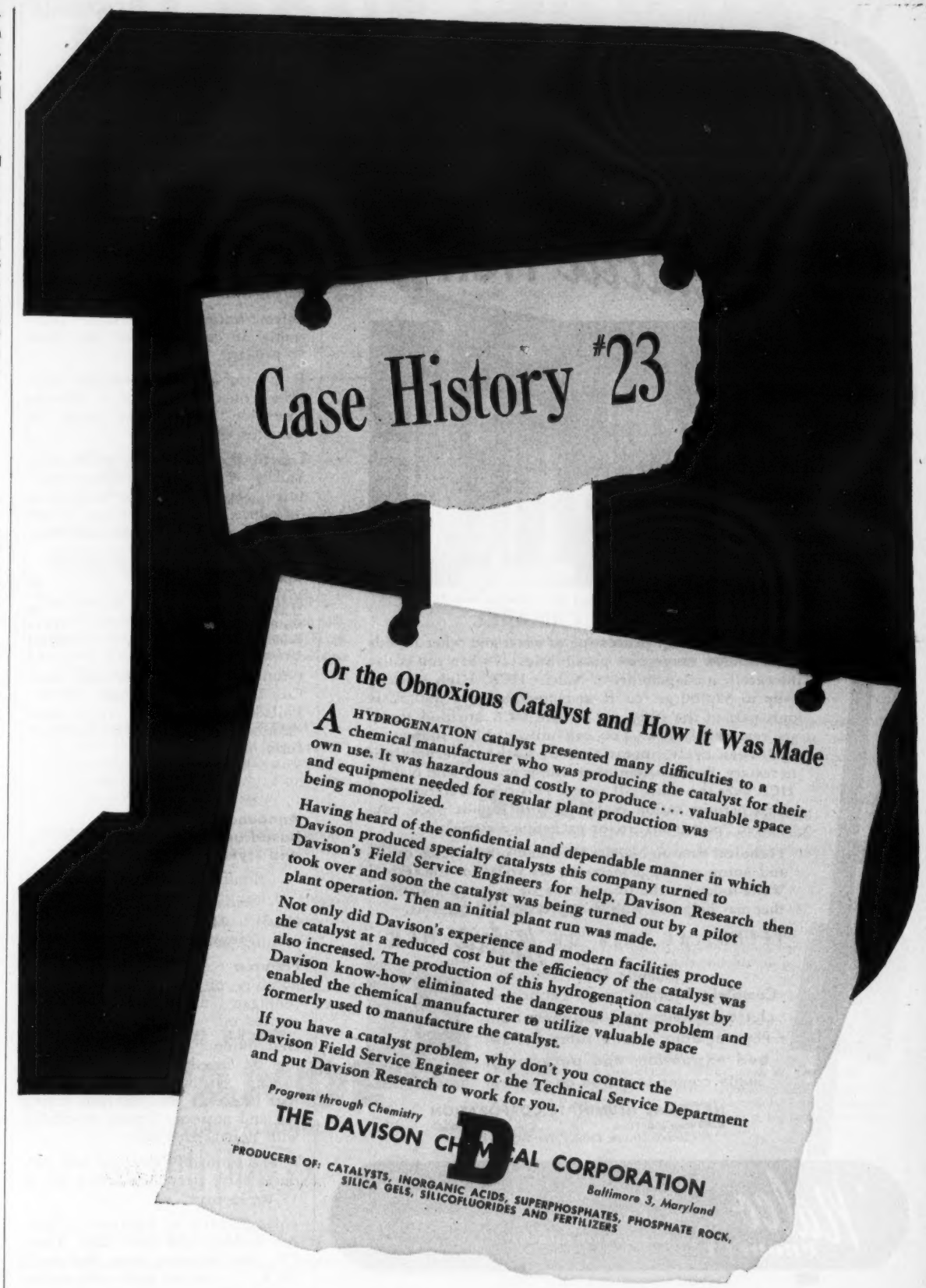
Additional field tests are now under way on cucurbits, ornamentals, onion, tomato, and potato. Data from these tests will be available soon.

(Samples for testing may be obtained from Dept. CP, Ethyl Corporation, Product Development, Research and Engineering Department, 100 Park Ave., New York 17, N. Y. . . . or for more information check CP 5913 on handy form, pages 2 and 3.)

***Summarizes technical data on diethyl oxalate***

General information, specifications, physical properties, uses, chemical reactions, toxicity, and shipping information are discussed in two-page bulletin. Two tables and several chemical reactions are included.

Several uses are suggested in Bul TDS-11 which is issued by Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. When inquiring specify CP 5914 on handy form, pages 2 and 3.)

When inquiring check CP 5915 on handy form, pgs. 2-3

# High Temperature High Capacity CATION EXCHANGE with Nalcite HCR*



Partial view of Nalco's modern ion exchange laboratory

CATION exchange processing of water and other liquids takes on new range, new possibilities . . . when you utilize the excellent adaptability of Nalcite HCR. High capacity —up to 32,000 gr./cu. ft. at temperatures to 250°F., is only part of the story . . . Nalcite HCR attrition losses are remarkably low. You can utilize either sodium or hydrogen cycle operation—or both—alternately if necessary. Fast, efficient operation is normal with Nalcite HCR over the entire pH range. This rugged styrene-type resin permits cation exchange with liquids once considered "poisonous" to ion exchange materials.

Technical data on Nalcite HCR and other Nalco cation and anion exchange materials are yours for the asking. Write today for the information or research assistance that may help you with your processing problems.

TECHNICAL DATA ON Nalcite HCR

(Bulletin 58)
Complete information on capacities, characteristics and regeneration. Physical data include rates of flow, bed expansion, and packaging. Single copies sent free on request.



NATIONAL ALUMINATE CORPORATION
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*In Canada: Alchem Limited, Burlington, Ontario*

Nalco PRODUCT — *When you use Nalcite resins, you take advantage of Nalco's long and broad experience in water and process technology.*

When inquiring check CP 5916 on handy form, pgs. 2-3


***Glacial methacrylic available in pilot plant quant'y . . .***

purity (by titration) is 99%; useful in polymerizations

**Uses:** Especially useful in non-aqueous polymerizations and copolymerizations. Benzoyl peroxide may be used for polymerization in organic solvents, while aqueous hydrogen peroxide and ammonium persulfate are satisfactory catalysts for polymerization in aqueous solution.

Polymerization is conducted preferably at concentrations less than 50 per cent.

It is also useful in reactions such as esterification and acid chloride formation where water cannot be tolerated.

**Description:** Glacial methacrylic acid is available in pilot plant quantities. Manufacturer's 90% aqueous, introduced several years ago, is still available in commercial quantities.

Typical properties are as follows:

| | |
|---|---|
| Purity (by titration), % | 99 |
| Water content, % | 0.1 |
| Color, APHA | 75 |
| Melting point, °C | 14-16 |
| Boiling range, °C | 159-163 |
| Hydroquinone content, % | 0.1 |

(Announced by Rohm and Haas Co., Dept. CP, 235 South 8th St., Philadelphia 5, Pa. . . . or for more information check CP 5917 on handy form, pages 2 and 3.)

***Announce drying oil based on linseed and styrene . . .***

eliminates previous necessity of using oxidized oil

**Uses:** Manufacture of protective coatings and alkyd resins.

**Features:** Eliminates previous necessity of using an oxidized or conjugated oil in producing a styrenated oil.

**Description:** Linstyrol is a drying oil based on linseed oil and styrene. It is completely miscible with solvents and refined drying oils and possesses limited miscibility with polymerized oils.

It is a brilliantly clear oil and produces hard, clear films which dry in 15 to 20 hr.

(Manufacturer of Linstyrol is Spencer Kellogg and Sons, Inc., Dept. CP, 100 Delaware Ave., Buffalo 5, N. Y. . . . or for more information check CP 5918 on handy form, pages 2 and 3.)





**Use ARCOS Stainless Electrodes**

Dependable weld performance on stainless fabrication requires weld metal with the correct chemical composition.

The Arcos quality controls give you this assurance with every lot of Stainless Electrodes you receive. From the chemical analysis of the raw materials, to the analysis of actual weld metal, every control test is applied to assure you chemically correct weld metal at all times. In your own plant that can mean improved welding performance . . . fewer rejects . . . lower weld costs.

New chart of typical weld metal analysis tells what Arcos electrodes deliver. Copy on request. Arcos Corporation • 1500 South 50th Street • Philadelphia 43, Penna.

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Stainless, Low Hydrogen and Non-Ferrous Electrodes

When inquiring check CP 5919 on handy form, pgs. 2-3

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When inquiring check CP 5920 on handy form, pgs. 2-3

### *Reaction products of 6 aromatic amines look helpful*

Tennessee Eastman Company has just made available information on six of their aromatic amines — phenyl diethanolamine, phenyl ethyl ethanolamine, 2,5-diethoxyaniline, 2,5-dimethoxyaniline, meta-tolyl diethanolamine, and ortho-tolyl propanolamine. This information is briefly summarized below:

**Phenyl diethanolamine:** light gray in color; has setting point of 50°C. Undergoes reactions of tertiary amines, forming salts and quaternary ammonia salts. Couples with diazotized amines, yielding various azo dyestuffs. Alcoholic hydroxyl groups esterify. Aromatic nucleus can be nitrated, sulfonated, and halogenated. Condenses with aliphatic aldehydes to yield resinous products, and condenses with aromatic aldehydes to give triphenyl methane materials.

**Phenyl ethyl ethanolamine:** amber colored solid with setting point of 32°C. Undergoes all reactions of tertiary amines, and reacts with aldehydes. Its one hydroxyl group affords reaction and condensation products which are less lyophilic than those from phenyl diethanolamine. Couples with diazotized amines to produce azo dyestuffs.

**Meta-tolyl diethanolamine:** light gray solid, setting at 62°C. Reactions are similar to phenyl diethanolamine. Product characteristics vary, however, due to methyl group in the benzene nucleus.

**Ortho-tolyl propanolamine:** amber colored liquid with boiling range of 170-180°C at 20 mm. Undergoes reactions typical of secondary amines. Couples with diazotized amines, yielding azo dyestuffs. Benzene ring can be nitrated, sulfonated, and halogenated. Reaction of the hydroxyl hydrogen with acids yields esters, while reaction of the nitrogen hydrogen yields acid amines.

**2,5-Diethoxyaniline:** nearly white crystalline solid melting between 82.5 and 85°C. Soluble in strong hydrochloric acid for easy diazotization. Diazo salts are light sensitive and are used in making black-line and brown-line papers. When amino group is protected through amide formation, compound can be nitrated and reduced.

**2,5-Dimethoxyaniline:** near-white crystalline amine melting at 79-81°C. Diazotized to yield a light sensitive diazo salt. Can be nitrated and reduced.

(Products of the Tennessee Eastman Company, Div. of the Eastman Kodak Company, Dept. CP, 260 Madison Avenue, New York 16, N. Y. . . . or for more information check CP 5921 on handy form, pages 2 and 3.)

### *Summarizes information on resin dispersions*

Sixteen-page bulletin features compounding data on aqueous dispersions of styrene resins. Following description of the various systems, bulletin reviews six factors which determine stability of the emulsions.

Section dealing with compounding covers plasticizers and waxes, plasticizer extenders, anti-block agents, thickening agents, pigmentation, solids, and foam depressants. Eleven applications are listed and described.

Tables and curves on physical properties of dispersions and films are included. Bul 58 is issued by Monsanto Chemical Co., Dept. CP, Springfield 2, Mass. When inquiring specify CP 5922 on handy form, pages 2 and 3.


# DU PONT "ELVANOL"
POLYVINYL ALCOHOL

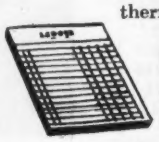
## can help you improve quality... cut costs in these industrial applications:



**ADHESIVES AND BINDERS.** High wet strength adhesives, remoistenable adhesives and strong, water soluble binders can be easily formulated with "Elvanol."



**TEXTILES.** Excellent abrasion resistance and adhesion make "Elvanol" an ideal size for the newer man-made fibers, nylon, viscose, acetate and cotton yarns . . . an ideal modifier for thermosetting resin finishes.



**PAPER.** "Elvanol" is useful in grease proofing, gas proofing, strengthening and improving the printing quality of paper.



**CERAMICS.** "Elvanol" improves the working characteristics of ceramic slips . . . can be used as a temporary binder in glazes, steatite bodies, etc.



**FILM.** The strength, gas proofness, and grease and solvent resistance of "Elvanol" film suggest its use as a water soluble packaging material for detergents, solid bleaches and other materials.



**EMULSIONS.** "Elvanol" can be used to emulsify or disperse such material as vegetable oils, mineral oils, solvents, plasticizers, waxes and resins.

### Properties of "ELVANOL"
POLYVINYL ALCOHOL

**WATER SOLUBLE**—dissolves easily in hot or cold water, depending on type and grade. No need for expensive organic solvents.

**RESISTANCE TO OILS, GREASE, SOLVENTS**—unaffected by contact with vegetable oils, greases and petroleum hydrocarbons. High degree of impermeability to such gases as oxygen, nitrogen, hydrogen, carbon monoxide.

**HIGH TENSILE STRENGTH AND FLEXIBILITY**—physical properties also include excellent resistance to tearing and abrasion, stability to sunlight and artificial light. Properties may be varied with plasticizers.

**EASILY MODIFIED** with plasticizers, extenders, gelling agents, colors, flame-retardants, etc.

**AVAILABLE IN SEVERAL GRADES**—each with different physical properties to meet specific industrial requirements.

### *FREE Illustrated Book*

*It tells you what "Elvanol" is . . . where it can be used in industry. You'll find complete information on grades of "Elvanol" available and methods of modification for specific uses.*




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Electrochemicals Department, Wilmington 98, Delaware.

Please send me your free book containing full information about Du Pont "Elvanol" polyvinyl alcohols. I am interested in investigating "Elvanol" for: ☐ Adhesives and binders ☐ Textiles ☐ Paper ☐ Ceramics ☐ Film ☐ Emulsions

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BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

When inquiring check CP 5923 on handy form, pgs. 2-3

### *Antibiotic is successful fungicide for plants*

Acti-dione, a product of the fermentation of *Streptomyces griseus*, has been shown to be highly toxic in very dilute concentrations to many plant disease fungi. Laboratory, greenhouse, and field tests have shown that the material has potential practical value as a fungicide for use on various agricultural crops. Acti-dione Ferrated is being offered as a turf fungicide based on extensive experimental and in-service tests on bent grass turf against the important turf disease fungi. The antifungal antibiotic effectively controls dollar spot, brown patch, snow mold, and the melting-out (Helminthosporium) disease.

Fungicidal efficiency is illustrated by the following tests: Acti-dione incorporated in culture medium showed that 38 different plant pathogenic fungi are completely inhibited by a concentration of 100 ppm (100 micrograms per milliliter). Only 4 required more than 30 ppm of Acti-dione for complete inhibition, and three required less than 1 ppm. Among those tested were:

| Pathogen | Disease | Ppm to Inhibit |
|---|---|---|
| Monolinia fructicola | Brown rot of fruit stones | 20.0 |
| Pythium debaryanum | Damping-off seedings | 20.0 |
| Gibberella saubinettii | Scab of cereals | 20.0 |
| Venturia inaequalis | Apple scab | 10.0 |
| Ustilago tritici | Loose smut of wheat | 0.125 |
| Diplodia zeae | Seed and stalk rot of corn | 1.25 |
| Colletotrichum phomoides | Tomato anthracnose | 10.0 |
| Rhizoctonia sp. | Brown patch of turf | 10 |
| Sclerotinia homeocarpa | Dollar spot of turf | 20 |
| Helminthosporium sp. | Melting-out of turf | 30 |
| Gloeocercospora sorghi | Copper spot of turf | 20 |

Other uses under investigation for Acti-dione include application against cherry leaf spot control, cucumber scab, rose mildew, and use as a wood preservative.

(Product of the Upjohn Company, Chemical Sales Division, Dept. CP, Kalamazoo, Mich. . . . or for more information check CP 5924 on handy form, pages 2 & 3.)

### *Announce fungicide with unusually broad range of effectiveness*

An experimental fungicide-nematocide when used at a dosage of 100 ppm in potato dextrose agar was shown to completely inhibit growth of the following organisms: *Aspergillus niger, Sclerotinia fructicola, Stemphylium sp., Rhizoctonia solani, Rhizopus nigricans, Alternaria solani, Frusarium oxysporium, Sclerotinia sclerotiorum,* and *Sclerotium rolfsii.*

The product, known as Compound N-521, is a nearly odorless, white crystalline solid having a melting point of 100-103°C. It is soluble in acetone, dioxane, and chloroform; slightly soluble in ethanol, benzene, and warm water; and insoluble in ether and carbon tetrachloride.

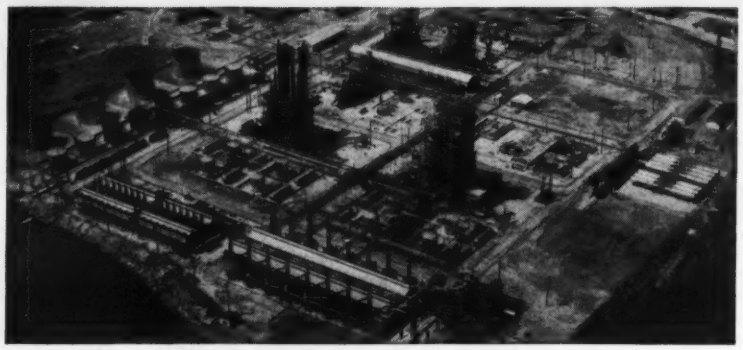
In soil treatment tests, inoculum of *Armillaria mellea* was placed at various depths in a 45 mm diameter vertical glass column filled with moist loam soil. Compound N-521 dissolved in acetone was then injected at the 6" level at a rate of 166 ppm per first column foot. Culture tests showed a 100% kill of fungus to a depth of 30".

Inoculum of *Verticillium albo-atrum* in moist soil was fumigated for 24 hr in sealed glass containers. A 100% kill of fungus resulted from dosages of 5 ppm and higher.

Control of damping-off on pea seedlings showed complete protection was afforded at a dosage of 166 ppm in soil

MONSANTO
CHEMICALS — PLASTICS

## Ethylbenzene Available from Texas City



1 From this modern plant comes Monsanto ethylbenzene in tank car, truckload and drum-size quantities. Increased capacity now makes this low-cost, reactable compound available for large-scale chemical processing.

*As a solvent,* Monsanto ethylbenzene is supplied at minimum 99% purity. Boiling point is in the xylene range: 136°C. (227°F.).

*As a gasoline blender,* Monsanto ethylbenzene increases aromatic content, raises octane number.

*As the starting point* Monsanto ethylbenzene aids in production of chlorostyrenes, intermediates, dyestuffs, pharmaceuticals. Here are just a few of the organic compounds that can be derived practically from Monsanto ethylbenzene.

5-*m*-Dioxanyl phenyl ketone
*alpha, alpha*-Bis (chloromethyl) acetophenone
2-Benzoyl-1, 3-propanediol diacetate
Acetophenone
*alpha*-Chloroacetophenone
*alpha, alpha'*-Dimethylhydrobenzoin
*alpha*-Methylbenzyl alcohol
*o*-Chlorobenzoic acid
*p*-Chlorobenzoic acid
*o*-Aminobenzoic acid
*p*-Aminobenzoic acid
1-Chloro-2-ethylbenzene
1-Chloro-4-ethylbenzene
1-Chloro-4(2)-(1-chloroethyl) benzene
*p*-Chloroacetophenone
*p*-Chloro-*alpha*-methylbenzyl alcohol
*o*(*p*)-Chlorostyrene
*p*-Chlorostyrene
8-Ethylquinoline
6-Ethylquinoline
*p*-Nitrostyrene
*o*-Ethylaniline
*p*-Ethylaniline
*alpha*-Methyl-*p*-nitrobenzyl alcohol
*o*-Ethylnitrobenzene
*p*-Ethylnitrobenzene
*o*-Nitroacetophenone
*p*-Nitroacetophenone
*o*-Nitrobenzoic acid
*p*-Nitrobenzoic acid
*o*-Aminoacetophenone
*o*-Amino-*alpha*-methylbenzyl alcohol
*p*-Ethylacetophenone
*p*-Ethylbenzoic acid
Methyl *p*-ethylbenzoate
Methyl *p*-acetylbenzoate
Methyl *p*-(1-hydroxyethyl) benzoate
Methyl *p*-vinylbenzoate
*p*-Ethylphenyl thiolacetate
*p*-Ethylbenzenesulfonyl chloride
*p*-Ethylbenzenethiol
*p*-Ethylbenzenesulfonic acid
*p*-Ethylphenol
*p*-Ethylphenyl acetate
*p*-Acetylphenyl acetate
*p*-(1-Hydroxyethyl)phenyl acetate
*p*-Vinylphenyl acetate
Ethyl *p*-ethylbenzyl ether
*p*-Ethylbenzyl chloride
*p*-Ethylbenzyl acetate
*p*-Acetylbenzyl acetate
*p*-(1-Hydroxyethyl)benzyl acetate
*alpha*$^1$-Methyl-*alpha*$^1$, *alpha*$^4$-*p*-xylenediol diacetate
*p*-Vinylbenzyl acetate
*p*-Vinylbenzyl alcohol

## Nontoxic Plasticizers Important in Medical And Surgical Fields

2 When blood or blood plasma is being administered to a patient, it flows through a small, unimportant-looking piece of tubing. However, army medics rightly call that tubing the "life line." It must meet the severest kind of requirements . . . be completely nontoxic as well as absolutely sterile.

In the production of such tubing, Monsanto plasticizers play a vital part. Santicizers* B-16, E-15 and 141 make possible the processing of such articles and impart softness, flexibility and chemical resistance.

Other important applications of nontoxic plasticizers in surgery include their use in the formulation of vinyl chloride for sponge material required in lung-collapsing operations.

These plasticizers are also used in the manufacture of hospital sheeting, prosthetic devices, gum dentures and similar products. Perhaps the special characteristics of Monsanto plasticizers can help you. Why not use the coupon for more information?

## Monsanto Penta Available In New Dustless Form

3 A new dustless form of pentachlorophenol, just announced by Monsanto, makes this widely-used wood preservative easier to handle. In addition, it dissolves more rapidly in petroleum oils. The regular dry-crystal form of Monsanto Penta still is available for those who prefer it.

The new Monsanto Penta has the same excellent wood-preserving qualities as the dry crystals. It will add years of life to wood by repelling termites and preventing decay. It can be formulated so that treated wood remains clean and paintable.

For information on the use of Monsanto Penta, contact the nearest Monsanto Sales Office or mail the coupon.

## Quick Facts About HB-40 Plasticizer

In the plastics field HB-40 can be used with polystyrene, vinyl resins, ethylcellulose and asphaltic compounds. It also acts as a "softener" or swelling agent for rubber-type compounds.

HB-40 imparts good tensile strength, nonmigration, and good moisture-resistant qualities to these plastics. It also has excellent electrical properties. All of these properties indicate a wide number of possible applications.

HB-40 has proved excellent for use in casting resins, vinyl plastisols, vinyl calendered film, profile extrusions and wire coatings. For complete information send in the coupon and receive your copy of our Technical Bulletin No. P-104.

## Need Some 6-Ethoxy-1, 2-Dihydro-2,2, 4-Trimethylquinoline?

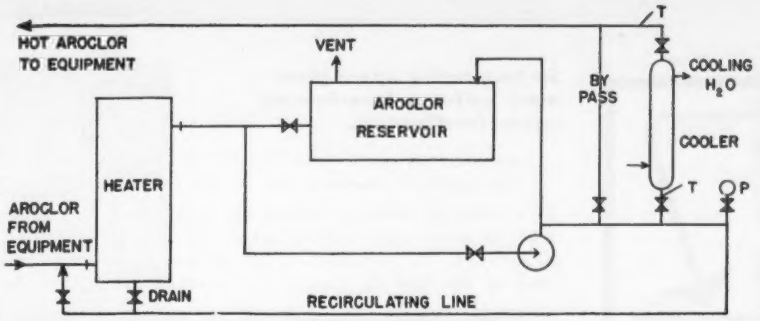
The answer to the headline is "yes" if you are in the rubber manufacturing business. This compound, called Santoflex* AW, is an effective means of reducing the attack of ozone on rubber.

Ozone, of course, is a highly active form of oxygen. Thus, even in small concentrations, it deteriorates rubber very quickly.

Santoflex AW reduces the attack of ozone and is particularly effective under dynamic conditions.

Santoflex AW is also a good antioxidant for the prevention of the usual deterioration on aging.

Santoflex AW, however, is only one of a wide line of rubber chemicals produced by Monsanto. Others include various types of accelerators and numerous special products. For complete information, use the coupon.




Flow diagram of portable heater.

## Aroclor 1248 as Heat-Transfer Medium Demonstrates Excellent Characteristics

Aroclor* 1248 is a nonflammable, liquid-phase, heat-transfer fluid, designed for operation at atmospheric temperature at maximum temperatures of 300° C.

Outstanding performance characteristics of Aroclor 1248 were recently demonstrated when it was used in a unit designed for pilot operations to reach temperatures not attained by ordinary steam pressures.

The basic factors of the design are as follows:

1. Operating temperature 300°C. maximum.
2. Capacity: approximately 40,000 B.t.u. per hour based on vaporizing about 200 pounds per hour of organic material having a heat vaporization of 150 B.t.u. per pound. Heat loss allowance: 30%.

Since it is frequently unsafe to make use of direct gas firing or inconvenient to use electrical strip heating, a different approach was developed.

A portable electric heater was devised using Aroclor as the heat-transfer medium. Aroclor, consisting of chlorinated biphenyl and polyphenyls, has several advantages. Extensive testing has shown it capable of meeting these requirements:

- Freedom from fire hazard.
- Viscosities sufficient to permit pumping at room temperatures.
- Boiling point sufficiently above 300°C. to assure liquid condition at all times.
- Stability against heat, plus enough safety factor to accommodate accidental overheating.
- Controllable vaporization losses.
- Freedom from corrosive action against valves, piping, tank, jackets, made of cast iron and steels, bronze and stainless steel.
- Freedom from toxicity hazard in properly enclosed system.

With a heat-transfer medium that could meet all these requirements—Aroclor 1248—a unit was built with the following elements (see flow diagram): A reservoir for the chlorinated Aroclor; a circulating pump and electric oil-immersion heater; a water-jacketed cooler; instrumentation to provide control of circulating fluid temperature; and pipelines from heating unit to and from equipment to be heated.

• • • • • • • • •

MONSANTO CHEMICAL COMPANY, 1700 South Second Street, St. Louis 4, Missouri. District Sales Offices: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle, Twin Cities. In Canada, Monsanto Canada Limited, Montreal.

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Technical Bulletins ☐ No. P-104, "HB-40"; ☐ No. P-130, "An Indirect Aroclor Heater for Unit Chemical Operations." ☐ Booklet, "Monsanto Chemicals for the Rubber Industry." ☐ Technical Data Report, TX12, subject: ethylbenzene.

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Name.....Title.....
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When inquiring check CP 5925 on handy form, pgs. 2-3

heavily inoculated with *Pythium* and *Rhizoctonia sp.* At 80 ppm the compound was 82% effective in preventing damping-off.

In nematoxicity tests, loam soil heavily infested with root-knot forms (*Meloidogyne sp.*) was fumigated for 48 hr in sealed glass jars. Dosages of 5 ppm and higher afforded 100% control.

Soil heavily infested with root-knot forms was packed in 45 mm vertical glass columns. The compound, in acetone solution, was injected at the 6" level at a rate of 166 ppm per first column foot. A 100% kill of nematodes was effected at the 27" depth and higher. At the 30" depth the kill was 95%.

Limited foliage tests have shown no unusual phytotoxicity hazards resulting from wettable powder sprays. Soil treatments have shown considerable toxicity to seeds when planted in soil sooner than one week after application. There has been no toxicity to seeds planted one week after treatment.

Compound N-521 has shown promise for certain specialized problems such as control of blue and green mold on oranges and control of fabric and leather deterioration.

(Product of Stauffer Chemical Company, Dept. CP, 420 Lexington Ave., New York 17, N. Y. . . . or for more information check CP 5926 on handy form, pages 2 and 3.)

### *Organic Si-F compounds no longer laboratory curiosities*

A series of organic silicofluorides has been recently introduced by The Davison Chemical Corporation. In addition, methods of commercial production have been devised which will take these products out of the stage of laboratory curiosities.

Six of the silicofluorides have been selected for introduction as representative of a group of some sixty which might be produced if the demand develops. Now available are the following:

**Methylamine silicofluoride**
**Dibutylamine silicofluoride**
**Ethylhexylamine silicofluoride**
**Aniline silicofluoride**
**"Rosin Amine" silicofluoride**
**Morpholine silicofluoride**

(The Davison Chemical Corporation, Dept. CP, Baltimore 3, Md. . . . or for more information check CP 5927 on handy form, pages 2 and 3.)

### *Report on use and properties of dibutyl phthalate*

One-page technical service report describes uses and lists physical properties of dibutyl phthalate. Substance is a stable, colorless, and odorless ester, and is reported to have outstanding value as plasticizer for nitro-cellulose lacquers. It is compatible in all proportions with cellulose nitrate and has high solvent power for cellulose mixed esters and other synthetic resins. It is used in compounding polyvinyl chloride, chloride acetate, and vinylidene chloride polymers.

Technical Report E-4 is issued by Witco Chemical Company, Dept. CP, 295 Madison Ave., New York 17, N. Y. When inquiring specify CP 5928 on handy form, pages 2 and 3.

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| Caprylate | 94% or better |
| Caprate | 92% or better |
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| Palmitate | 70% or better |
| Also methyl ester of coconut fatty acid. | |
| FATTY ACIDS | |
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| Myristic | 92½% or better |
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## *Surface active agent gives more uniform, free-flowing mixed fertilizer . . .*

anionic-type agent improves condition of final product, and increases reaction rate during manufacture

As a result of extensive laboratory, production, and field tests, an anionic-type surface active agent is being incorporated into the manufacture of various grades of plant food at the East St. Louis, Ill. plant of Illinois Farm



Treated fertilizer is a free-flowing, easily handled material. Product is being emptied into mixed goods receiver hopper prior to being processed for bagging operation

Supply Co., manufacturer of chemical products for agriculture. It has been shown that addition of the agent improves condition of the final product, increases the reaction rate during manufacture, and noticeably reduces curing time of the product.

A surface active agent is a substance that alters or modifies the phenomena of surface forces and surfaces. Since the agents tend to concentrate at surfaces rather than in the residual portion of the solution or medium, a low concentration of the agent can generally be quite effective in altering or modifying the surface properties. In theory, a surface active agent would lower surface tension of the liquid phase and the solid phase of a mixture and allow the liquid phase to adhere to, spread over, wet, and, if possible, penetrate the solid phase particles.

In manufacture of fertilizer mixtures, although a solvent must be present to have as much of the mixture in solution or semi-solution as possible, the liquid phase must be held to a practical limitation to insure prevention of the "salting-out" effect in the packaged product.

Theoretically, alteration or modification of surface phenomena results in complete reaction between reactants and also throughout the solid phase particles or agglomerates, providing the solvent medium and temperature conditions are favorable. With the incorporation of surface active agents into the process, according to the producer of the fertilizers, less solvent medium may be employed in the process and higher initial reaction temperatures are possible because the concentration of reactants is increased with the result that reaction rate is increased and reaction is more complete. Furthermore, the "salting-out" effect in packaged products can be greatly minimized because proportion of liquid phase or solvent may be greatly reduced. Laboratory tests to determine the effect of surface active



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In San Francisco: The Griffin Chemical Company.

In Europe: Quaker Oats-Graanproducten N.V., Rotterdam, The Netherlands; Quaker Oats (France) S. A. 42, Rue Pasquier, Paris 8e, France.

In Australia: Swift & Company, Pty., Ltd., Sydney.

In Japan: F. Kanematsu & Co., Ltd., Tokyo.

When inquiring check CP 5931 on handy form, pgs. 2-3



Effects of use of surface active agent in mixed fertilizers is shown in comparison of two batches of complete fertilizer made with and without conditioner. Material at left demonstrates results of "salting-out" after 30-day cure. Material at right, treated with 0.05% by weight of agent, is loose and free of agglomerates after 4-day cure

agents were conducted using samples of mixed fertilizers with a wide range of nitrogen, phosphorous, and potassium analyses. A portion of the data as presented by the manufacturer of the fertilizers in a report made before a research association is summarized in the accompanying table. Although a flake form of the conditioner was employed in these tests, additional data are available for tests made with a spray-dried form of the agent. Results indicated that of the three types of agents — catonic, anionic, and nonionic — the anionic gave the best results at minimum cost of treatment. In tests involving the 3-12-12 analysis for

Experimental Data for Surface Active Agent in Mixed Fertilizers

| Batch | N-P-K Analyses | Date Manufactured | Date Bagged | Bag Temp °F | Bin Temp °F | Date Examined | Cond. of Matl. |
|---|---|---|---|---|---|---|---|
| A | 3-12-12 | 10/10-11/51 | 10/21/51 | —— | —— | Approx 11/11/52 | F* |
| B | 4-16-16 | 12/13-20/51 | 1/23/52 | 80 | 98 | 2/20/52 | F |
| | | | 1/30/52 | —— | 98 | 2/20/52 | F |
| | | | 1/23/52 | —— | —— | 4/3/52 | F |
| | | | 1/23/52 | —— | —— | 5/12/52 | F |
| C | 3-12-12 | 2/20-25/52 | 3/6/52 | 83 | 106 | 4/3/52 | F |
| | | | 3/6/52 | 83 | 106 | 5/12/52 | F |
| | | | 3/10/52 | 95 | 126 | 5/12/52 | F |
| | | | 3/12/52 | 90 | 112 | 5/12/52 | F |
| D | 3-9-27 | 5/7-9/52 | 5/13/52 | 70 | 76 | 5/26/52 | F |
| E | 3-12-12 | 3/28-4/2/52 | 4/21/52 | 72 | 76 | 5/26/52 | F |
| F | 4-16-16 | 4/4-8/52 | 4/22/52 | 110 | 140 | 5/26/52 | F |
| | | | 5/8/52 | 92 | 122 | 5/26/52 | F |
| G | 3-12-12 | 4/16-17/52 | 5/8/52 | 120 | 145 | 5/26/52 | F |
| H | 3-12-12 | 3/28-4/2/52 | 4/22/52 | 94 | 120 | 5/26/52 | F |
| I | 10-10-10 | 3/27-4/2/52 | 4/21/52 | 84 | 110 | 5/26/52 | U |
| J | 3-12-12 | 4/8-10/52 | 4/11/52 | —— | —— | 5/26/52 | F |

*F—Favorable, U—Unfavorable

nitrogen, phosphorous, and potassium, the control sample contained no surface active agent while the two remaining samples contained 0.05% of the agent by weight with varying amounts of moisture. The samples containing the agent exhibited superior qualities at all stages of the tests with respect to dryness and caking. Similar results were noted in tests using samples of various surface active agents and samples of N-P-K ratios of 1-1-1, 1-3-2, 1-4-4.

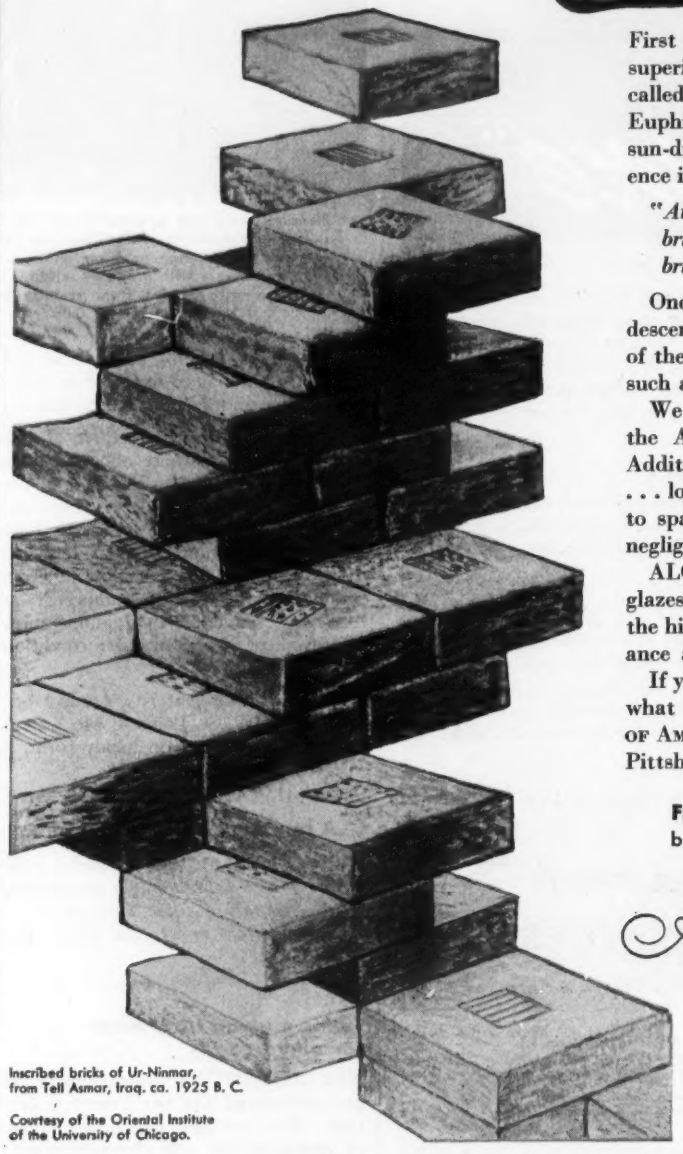
As a result of the tests an alkyl-aryl sulfonate-type, anionic surface active agent, Santomerse No. 1, has been incorporated into manufacture of various grades of plant food

(*Continued on next page*)


Inscribed brick of Bilalama, from Tell Asmar, Iraq. ca. 1975 B. C.




*Ceramics and Man through the Ages*



Inscribed bricks of Ur-Ninmar, from Tell Asmar, Iraq. ca. 1925 B. C.

Courtesy of the Oriental Institute of the University of Chicago.

First people in Western Asia to develop a civilization superior to the Neolithic were the Sumerians, later called Babylonians. Absence of stone in the Tigris-Euphrates valleys forced these builders to turn to sun-dried or kiln-dried bricks, of which the first reference is found in Genesis xi, 3:

*"And they said one to another, Go to, let us make brick, and burn them thoroughly. And they had brick for stone, and slime had they for mortar."*

One of man's earliest inventions, the brick has descended with various modifications from the building of the Tower of Babel to its multiple present day uses such as refractory brick.

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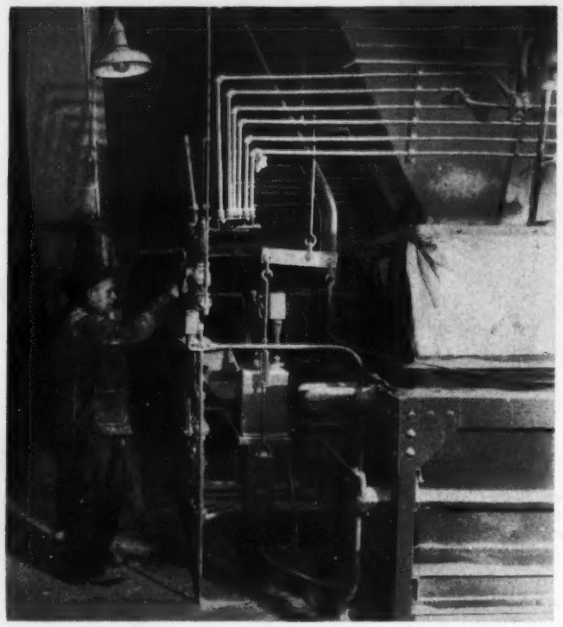
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W. Coast Agent: Griffin Chemical Co., San Francisco, Los Angeles
Midwest Agent: Kraft Chemical Co., Inc., 917 W. 18th Street, Chicago
Wasatch Chemical Co., Salt Lake City, Utah
Southwest Agents: Barada & Page, Inc., Dallas, Houston, Kansas City, etc.
Chas S. Tanner Co., 1815 Liberty Life Bldg., Charlotte, North Carolina

When inquiring check CP 5933 on handy form, pgs. 2-3


(Continued from preceding page)



Blending scale with pneumatic controls is used to proportion dry ingredients of fertilizer mix prior to addition of ammoniating solution in mixer on floor below. Although proportions vary with grade of fertilizer, conditioner, which is added with feeder from storage hopper (invisible), remains at rate of 0.05% by weight

at the rate of 0.05% (or one lb per ton of mixed fertilizer). Material is dispersed as well as possible throughout the weighing cycle of the batch ingredients.

According to the manufacturer of the fertilizers, the following advantages were obtained through use of the surface active agents: 1) increase in ammoniation rates per unit of $P_2O_5$ and more even dispersion of anhydrous ammonia throughout the phosphatic ingredient particles; 2) increase in reaction rate; 3) tendency of reaction to be more complete; 4) reduction in required curing time of product; 5) decrease in number of large particles in mixtures and reduction in agglomeration tendency; and 6) improvement in the ultimate condition of the N-P-K fertilizer mixture.

(Surface active agent is a product of Monsanto Chemical Co., Dept. CP, St. Louis 4, Mo. . . . or for more information check CP 5934 on handy form, pages 2 and 3.)

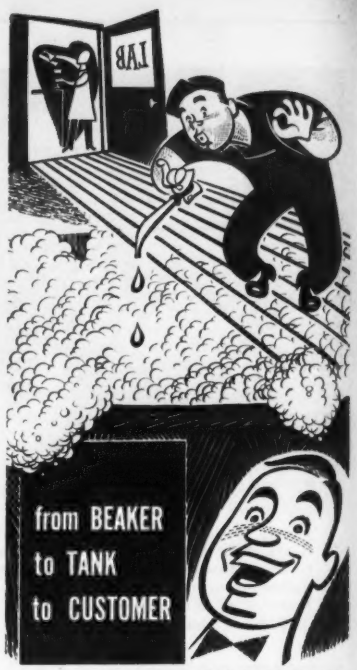
**A company name and address . . .**

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THE EDITORS

### *Tailor-making fatty acids for alkyd resins*

New products and improvements in existing products are announced for the Emery vegetable type fatty acid line. The complete line now embraces a broad selection of compositions and characteristics to satisfy any vegetable requirements. Special grades of soya, cottonseed,


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In laboratories or in commercial production and packaging, Dow Corning Antifoam A saves time; saves productive capacity now wasted on foam; eliminates overflowing and fire hazards; improves the finished product.

*Foaming antifreeze agents,* for example, may overflow and cause serious damage to automobiles driven with partially filled radiators. Even though such damage is usually traceable to air leaks in the cooling system, leading producers protect themselves and their customers by adding a trace of Antifoam A.

Heat-stable and practically inert physiologically, Antifoam A is generally effective at concentrations ranging from 1 to 200 ppm. It can be used as received or dispersed in a solvent. Where solvents are taboo, try one of our water dispersible emulsions of Antifoam A.

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City State

DOW CORNING CORPORATION
Midland • Michigan

When inquiring check CP 5935 on handy form, pgs. 2-3

corn, and coconut are now tailor-made for alkyd resins manufacturers.

(Emery Industries, Inc., Dept. CP, Cincinnati 2, Ohio . . . or for more information check CP 5936 on handy form, pages 2 and 3.)

### 300°C within serviceable temp of electrical insulating silicone varnish

**Uses:** Silicone varnish for use as an electrical insulating coating for glass cloth and sleeving, and also for binding mica combinations. Good heat stability suggests use in other branches of the coating industry.

**Features:** Maker reports that this product is the most heat stable silicone varnish yet developed. In preliminary tests, aluminum panels coated with the varnish had a flex life of over 1000 hours at 250°C and a craze life of over 3000 hours at 250°C. Higher temperature tests showed a flex life of over 500 hours at 300°C and a craze life of over 800 hours at 300°C. Glass cloth coated with the varnish is said to retain over 65% of its dielectric strength after exposure to 275°C for 100 hours.

**Description:** Dow Corning 994 Varnish is moderately fast curing and gives a very flexible film. A cure of 1 hour at 250°C is recommended for most applications.

Typical properties are outlined below:

| | |
|---|---|
| Solids, % | 50 |
| Color | light straw |
| Specific gravity @ 25°C | 1.00-1.02 |
| Weight per gallon, lb | 8.4 |
| Viscosity @ 25°C, cp | 80-125 |
| Solvent | xylene |
| Thinners | aromatic hydrocarbons |
| Flash point | red label required |
| Dielectric strength, v/mil* | 1600-1900 |

*Measured on standard 3 mil cloth coated to 7 mil.

(Product of the Dow Corning Corporation, Dept. CP, Mich. . . . or for more information check CP 5937 on handy form, pages 2 and 3.)

### Oxidizing agent purifies metal salt solutions

Eight-page bulletin gives complete directions for isolating metal salts from processing solutions with hydrogen peroxide. Process as described in bulletin eliminates time-consuming procedure of "air blowing" wherein air oxidation resulted in slow process and incomplete reaction with polyvalent metal ions.

Incorporation of hydrogen peroxide, soluble oxidizing agent with high oxidation potential, in processing solutions speeds isolation of metal salts. Procedure may be used to separate minor amounts of dissolved metals from bulk of processing solutions, to free solution from objectionable iron salts, or to effect clean separation of valuable solution constituents.

Bulletin gives complete directions for isolating metal salts from process solutions used for electrolytic nickel plating, beryllium production, magnesium production, phosphatizing, optical glass production (containing lanthanum salts), and tin recovery from non-ferrous scrap.

Bul 26 is issued by Buffalo Electro-Chemical Co., Dept. CP, Station B, Buffalo 7, N.Y. When inquiring specify CP 5938 on handy form, pages 2 and 3.





now available in pilot-plant quantities

*Properties of a typical sample of Jefferson's Propylene Carbonate are:*

| | |
|---|---|
| Boiling point, °C | 242 |
| Freezing point, °C | —49 |
| Flash point (open cup), °F | 270 |
| Refractive index at 20°C | 1.4209 |
| Specific gravity, 20/4 °C | 1.2057 |
| Appearance | Mobile water-white liquid |
| Viscosity, centistokes | |
| at —40°F | 19.4 |
| at 100°F | 1.67 |
| at 210°F | 0.78 |

*Suggested Applications:*

hydraulic fluids
solvent and selective solvent
chemical intermediate
hydroxypropylating agent

You may obtain technical information and experimental samples* for research and development by writing to our Market Development Division, Dept. D.

★ Ethylene Carbonate samples and data are also available.

Jefferson CHEMICAL COMPANY, INC.
260 MADISON AVENUE, NEW YORK 16, N. Y.
Houston Sales Office: 318 Melrose Building, Houston 2, Texas
Warehouse Stores: Tenafly, New Jersey; Chicago, Illinois; Houston, Texas

*Essential Chemicals From Hydrocarbon Sources:*
Ethylene Oxide
Ethylene Glycol
Ethylene Dichloride
Diethylene Glycol
Monoethanolamine
Diethanolamine
Triethanolamine

When inquiring check CP 5939 on handy form, pgs. 2-3

***Tests reveal effectiveness of agricultural fungicide . . .***

activity increases after application; resists rainfall, shows promise in emulsions

Screening tests conducted on a new fungicide (Organo-Copper Fungicide) announced by the Phelps Dodge Refining Company are as follows: 1) found an effective fungicide against Early Blight (*Alternaria solani*) on tomatoes; 2) the fungicidal effectiveness increases the first 3-4 days following application and may be maintained over a period of about two weeks; 3) aerosol formulations containing 1-8% metallic copper, at appropriate dosage ranges, have given effective control of *Alternaria* without being phytotoxic to tomato foliage.

4) Aerosol deposits adhere well during rainfall tests, with its retention on foliage being comparable to Bordeaux; 5) Organo-Copper is slightly less effective than Bordeaux per unit copper applied to the foliage but loses its effectiveness less readily over a two or three week period; and 6) preliminary tests have shown the product to have promise in emulsion formulations.

Organo-Copper is in the form of a dry powder. It is copper sulfide xanthate containing 50% metallic copper. It is slightly soluble in paraffenic solvents and very soluble in aromatic solvents with intermediate solubility in naphthenic and cylco-paraffenic solvents.

(Organo-Copper is being offered for experimental testing in 1952-1953 for aerosol, emulsion, and concentrate formulations by Phelps Dodge Refining Corp., Dept. CP, 40 Wall St., New York 5, N. Y. . . . or for more information check CP 5940 on handy form, pages 2 and 3.)

***Modification of 2,4-D weed killer makes chemical beneficial to tomato plants . . .***

further studies in progress may reveal more about plant-growth regulating materials

Chemical weed killer, known as 2,4-D (2,4-Dichlorophenoxyacetic acid), has been modified so that certain forms of it are beneficial to tomato plants, according to preliminary tests announced by US Dept. of Agriculture. Unmodified 2,4-D harms tomato plants, curling leaves, stopping growth, and even killing some plants. Modified 2,4-D caused tomatoes to "set" and develop without pollination. Tomatoes were of increased size and excellent quality.

Work thus far has been done under controlled greenhouse conditions. Further studies, including field tests, are necessary before applications of commercial value are shown. Modification of weed killer was by chemical combination with certain amino acids which were prepared in laboratory.

Destructive power of 2,4-D is contained in the carboxyl group. Plan was to harness this lethal group in some way to control it. This was accomplished by treatment with the amino acids, resulting in "amide linkage." Some plants can split this link enzymatically and are affected by destructive carboxyl group. Other plants are unable to do so and may be aided by modified 2,4-D.

USDA scientists found that 2,4-D retained destructive properties when treated with naturally-occurring amino acids but was converted into beneficial type when combined with certain laboratory-synthesized amino acids. Field tests on modified chemical are now in progress. Further



# ARQUADS CONTROL CORROSION AND ALGAE IN OIL RECOVERY OPERATIONS

*By Dr. M. R. McCorkle, Technical Director, Armour Chemical Division*

Year in and year out, corrosion continues to be the No. 1 problem of the petroleum industry. Thousands of dollars and man-hours have been spent seeking a solution to the problem.

One group of products in particular has proven to be most effective, even in extremely low concentrations. These are Arquads, a series of quaternary ammonium chlorides manufactured by the Armour Chemical Division. They are cationic agents that possess unique wetting properties and high surface activity. Not only have these materials proven to be good protective agents in combating corrosion but they also effectively control bacteria and algae growth.

### CORROSION CONTROL IN SOUR CRUDE WELLS

In a sour crude producing well in west Texas, the rate of corrosion was reduced by 93% after the introduction of Arquad 2C. Since cost is an important factor, it is worth noting that this treatment costs about one-half the average of similar treatments using competitive inhibitors.

### WATER FLOODING AND BRINE DISPOSAL OPERATION

For years, water systems have been plagued by corrosive salts and bacterial-algae growth, resulting in frequent shutdowns and costly repairs. The results of recent field tests conducted with Arquad S-2C offer convincing evidence that pipelines, secondary recovery and brine disposal operations and other water systems can be made relatively free of these troubles.

In one location at an eastern Oklahoma flood system, the rate of corrosion was reduced 99.5%. In another flood system in eastern Kansas, Arquad S-2C reduced the rate of corrosion by 95%.

### CORROSION INHIBITION AND ACID WATERS

In secondary recovery water floods as well as water disposal systems, acid waters are frequently used. Not only do they materially improve injection rates but they assist in opening the formation through the dissolution of corrosion products. However, there is one real disadvantage to using acid waters; they have a severe corrosive action on metal equipment. This can be overcome by the use of Arquad 2C.

### STABILITY OF ARQUADS

All Arquads are compatible with cationic and non-ionic materials. They are not compatible with anionic materials, such as soaps or common synthetic detergents. The Arquads are stable under both acid and alkaline conditions. They are also stable in the presence of naturally occurring water-soluble salts and are not precipitated by hard water. Being highly surface-active chemicals, they effectively lower the surface tension of water.

### FURTHER INFORMATION AND SAMPLES

For more information on the inhibition of corrosion in the petroleum industry, send for our new technical bulletin E-6. Check the coupon for this bulletin and at the same time order samples of Arquads 2C and S-2C with which to begin your own testing and evaluation of these chemicals.

# DUOMEEN T AS ASPHALT ADDITIVE AND ANTI-STRIPPING AGENT

Duomeen T is a fatty diamine developed by the Armour Chemical Division for use as an anti-stripping agent for asphaltic materials. This chemical actually bonds the asphalt to the mineral surface. It can be blended with fatty and/or petroleum acids, together with a suitable diluent, to produce a highly efficient asphalt additive or anti-stripping agent for "on the job" use.

Duomeen T contains both a hydrophobic group, having an affinity for oil, and two polar amino groups which are strongly adsorbed on the surface of aggregates. The result is a strong, permanent bond between the asphalt and mineral, whether the aggregate is wet, damp, dry or cold. Duomeen T requires a heat source, and is recommended for use primarily at asphalt refineries and mixing plants.

### SPECIFICATIONS

| | |
|---|---|
| Melting Range | 44°-48°C. |
| Percent Amine (as diamine) | 80% min. |
| Combining wt. | 400 (Theo 320) |
| Moisture | 1% max. |

A light tan solid, this chemical is soluble in asphaltic, aromatic and petroleum hydro-carbons. The addition of various acids to Duomeen T improves the adhesion of asphaltic materials to basic aggregate. These include: crude tall oil, tall oil fractions (such as Armour's Neo-Fat 42-12 or Neo-Fat 42-06), fatty acids, fatty acid foots or petroleum acids together with fuel oil diluents.

Duomeen T, having two amine groups, is capable of forming salts with either one or two moles of acidic materials. In some instances, where calcareous minerals predominate, an excess of acid (more than two moles) is beneficial. The mixture of Duomeen T and acids may be diluted with various amounts of petroleum solvent to obtain the desired viscosity. Send for further information and free samples.




### THE ARNEELS

A series of high molecular weight aliphatic nitriles, the Arneels offer interesting raw materials for chemical synthesis. They have proved excellent softening agents for several synthetic rubbers and synthetic elastoplastics. They also serve as softening agents in many processes. A recently completed booklet covers this new series of Armour chemicals. For your free copy, send the coupon.

### THE DUOMEENS

Complete technical data on a new group of Armour Chemical Division products, the Duomeens, is offered in an illustrated booklet. The Duomeens have exhibited properties valuable in many fields, particularly as asphalt additives, as germicides, and as anti-corrosion agents. Send the coupon for your free copy of this booklet.

ARMOUR CHEMICAL DIVISION
ARMOUR AND COMPANY · 1355 WEST 31ST STREET · CHICAGO 9, ILLINOIS

## NON-YELLOWING VINYL CHLORIDE POLYMER STABILIZERS WITH ARMOUR'S NEO-FAT 12



There is an ever-increasing demand for vinyl chloride polymer type products which have improved resistance to the yellowing caused by the action of heat and/or light.

It has been the practice in the past to use stearic acid or low purity mixed coco fatty acids containing varying amounts of stearic, oleic and linoleic fatty acids. Soaps of these acids are not completely compatible and result in "blooming" or cloudy films. The presence of unsaturated acids contributes to undesirable yellowing and in pigmented films produces off-shade colors.

Neo-Fat 12 (lauric) soaps have shown outstanding merit in this application. They are compatible and do not contribute to cloudiness, bloom or yellowing in the vinyl films. The reasons for this are high lauric fatty acid content (95% min.) and the absence of stearic, palmitic and unsaturated acids. In addition, the high acid value, low moisture, and low unsaponifiable content insure a maximum of metal per pound of stabilizer. Stabilizers based on Neo-Fat 12 are extremely resistant to water leaching when used in vinyl films. Send the coupon for a sample of Neo-Fat 12 with which to begin your testing and evaluation of this outstanding new material.

# ARMOUR'S FRACTIONATED COCONUT OIL FATTY ACIDS NOW EVEN HIGHER IN PURITY

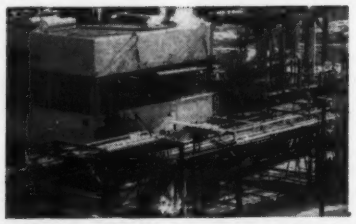
Armour's Neo-Fat coco acids are now available in concentrations of above 92%. This is a degree of purity never before available, and, to mark the change, Armour has re-labeled the Neo-Fats. In the specification chart below, the old number, in parenthesis, follows the new. At the same time that purity standards have been raised, the iodine value has been lowered and the color has been lightened.

Ordinary distilled coconut oil fatty acids are mixtures of nine different fatty acids in percentages varying from 0.5% to 48%. Each of the nine component acids has its own specific chemical and physical properties which make it valuable for certain uses but unsatisfactory for others. Today, however, you are no longer forced to buy a mixture of nine different fatty acids to get the one you really want.

A new specification chart has just been prepared which includes all pertinent information on these versatile chemicals. Check the coupon for your free copy of this chart. In addition, get the Neo-Fat booklet for end-use information. This new booklet contains much valuable data on the Neo-Fat fatty acids and their use.

| | Iodine | | Acid Value | | Titer, C. | | Color, Lovibond 5¼" | Caproic | Caprylic | Capric | Lauric | Myristic | Palmitic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | Min. | Max. | | % | % | % | % | % | % |
| Neo-Fat 8 (7) (caprylic acid) | — | 1.0 | 387 | 392 | — | 16° | 2 R-20 Y | 3 | 93 | 4 | | | |
| Neo-Fat 10 (9) (capric acid) | — | 1.0 | 323 | 329 | 28° | 33° | 2 R-20 Y | | 3 | 92 | 5 | | |
| Neo-Fat 12 (11) (lauric acid) | — | 1.0 | 278 | 282 | 41° | 44° | 1.0 R-10 Y | | | 1 | 95 | 4 | |
| Neo-Fat 14 (13) (myristic acid) | — | 1.0 | 243 | 249 | 48° | 52° | 1.0 R-10 Y | | | | 3 | 94 | 3 |

# NEW SOLVENT CRYSTALLIZED OLEIC ACIDS



Ester-free oleic acids are the result of a new Armour Chemical Division process which utilizes a solvent which does not react with the raw materials. This new process, combined with Armour's low temperature crystallization, assures you advantages not found in ordinary distilled or pressed oleic acids. The extremely low temperatures employed guarantee a substantially lower saturated fatty acid content than conventional types of oleic acids. These new products are characterized by bland odor and excellent heat stability.

Here are the 6 oleic acids: Low Titer Red Oil, 8-11° Red Oil, Saponified Red Oil, Low Titer White Oleic, 8-11° White Oleic, Commercially Pure Oleic.

All 6 of these acids are available in 55 gal. drums and 4,000 and 8,000 gallon aluminum tank cars. Send the coupon today for specifications and current price quotations.


Send Samples: ☐ Arquad 2C ☐ Arquad S-2C ☐ Duomeen T ☐ Neo-Fat 12

Send Literature: ☐ Tech. Bul. E-6 ☐ "Asphalt Additives" ☐ Oleic Acids Specs. and prices ☐ Arneels booklet ☐ Duomeens booklet ☐ Neo-Fat Spec. chart ☐ "Fractionated Coco Oil Fatty Acids"

Name ---------- Title ----------

Firm ----------

Address ----------

City ---------- Zone ---------- State ----------


When inquiring check CP 5941 on handy form, pgs. 2-3

***Reported to solve need for an easy-to-use radioactivity decontaminating agent***

Need for an easy-to-use cleaner which could work effectively as a surface decontaminating agent for radioactives has reportedly been met by "CP Cleaner." Unique properties of penetration and sequestering of ions, dirts, and greases, and holding them in suspension, accounts for its effectiveness. Almost neutral pH of the agent makes it particularly versatile and effective for use on the human body.

CP Cleaner is provided in powder form and dissolves readily in soft, hard, or even salt water, for use on any surfaces.

In tests, it was found possible to reduce radio activity of an object to within the background count, or very slightly above, by boiling vigorously in a CP Cleaner solution for about a half hour, and then rinsing. Complete decontamination was obtained by use of brush and hot water with a good rinse — provided the contaminated surfaces can be scrubbed.

(Product of Enley Products, Inc., Dept. CP, 254 Pearl St., New York, N. Y. . . . or for more information check CP 5942 on handy form, pages 2 and 3.)

***Glycolonitrile derivatives look highly useful in variety of fields . . .***

sequestering agents, gas absorbents, insecticides, pharmaceuticals, resin intermediates, etc

The newest member of the Rohm and Haas family of cyanohydrins is glycolonitrile — a commercially available, clear, colorless to light yellow liquid furnished as a 70% aqueous solution. The anhydrous product (boiling point 183°C at 759 mm) can be obtained by distillation under vacuum.

Glycolonitrile will undergo esterification, ether formation, reductive methylation, hydrolysis, and simultaneous dehydration and hydrolysis — generally with excellent yields. The product is reported to offer a convenient method of cyanomethylation with a single reagent in place of the mixture of formaldehyde and hydrogen cyanide.

Applications have included use as a solvent for polyacrylonitrile. Derivatives have been used as sequestering agents, gas absorbents, insecticides, pharmaceuticals, and resin intermediates. Glycine, a derivative, has been used as a component for dentifrices, for neutralizing artificial tanning materials, as a dyestuff intermediate, and as an ingredient of animal feeds. Reaction of glycinamide and formaldehyde reportedly yields resins which are useful in the stabilization of textiles and the preparation of molded and laminated articles.

(Technical data on this product and experimental samples are offered by Rohm and Haas Company, Department CP, Washington Square, Philadelphia 5, Pennsylvania . . . . or for more information check CP 5943 on handy form, pages 2 and 3.)

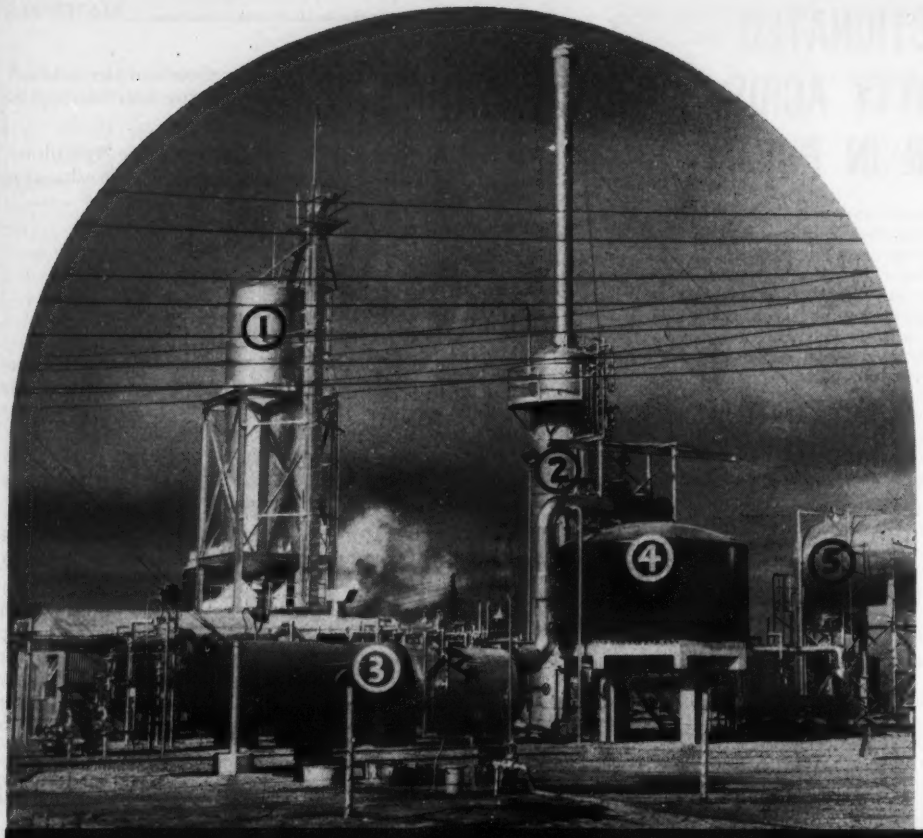
***studies under way may reveal more about complex relationships of plant-growth regulating chemicals and plant enzyme systems.***

(Courtesy of United States Department of Agriculture, Agricultural Research Administration, Washington 25, D. C.)

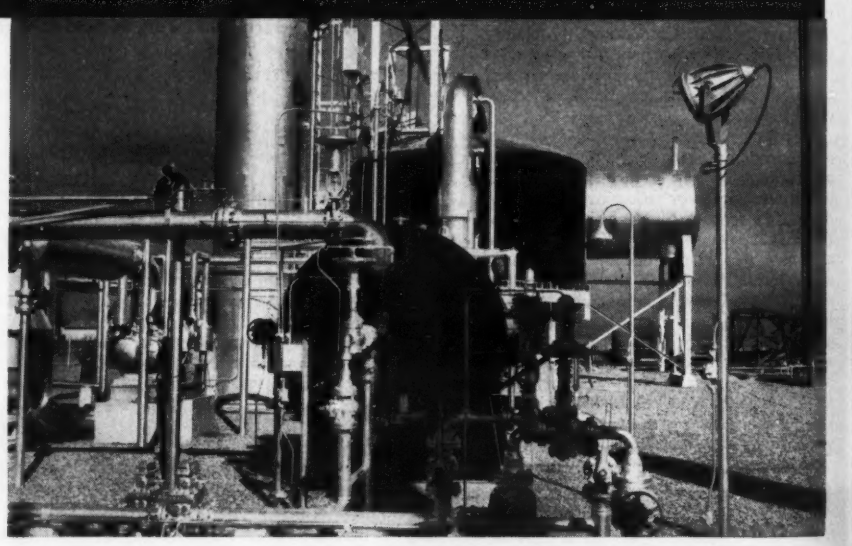
*Ideas*

# 20-ton-per-day Sulfur Recovery Plant Operating at Profit in Texas

**Automatic control and advanced methods of sulfur handling pay dividends in making sulfur from amine-type desulfurizer acid gas**




Overall view of sulfur recovery plant in the Permian Basin of West Texas shows 1) flaked sulfur storage bin, 2) sulfur condenser-scrubber, 3) heat recovery boiler, 4) catalytic reactor, 5) liquid sulfur storage tank



Front end of heat recovery boiler, with reactor and molten sulfur storage tank directly behind

ALTHOUGH some said it couldn't be done economically in a plant with less than 50 tons per day capacity, sulfur is being recovered from refinery waste acid gas at a profit, in a 20 ton per day plant down in Texas. However, it took some good planning so that the minimum of manpower could be used in operating the plant. Automatic control and novel methods of material handling have cut labor requirements down to three manhours per day. The same personnel can keep both the sulfur recovery unit and the amine gas desulfurization unit running at the same time. This last unit processes residue gas from the Odessa Natural Gasoline Corp. plant near Odessa, Texas, and its waste gases are the ones treated to recover the elemental sulfur.

The plant, a joint venture of the Sid Richardson Carbon Co. and the Odessa Natural Gasoline Co., is located at the latter's plant site in the Permian Basin Area of West Texas. It is the forerunner of several such recovery units slated for this area, which is a potential source of several hundred tons per day of elemental sulfur to be obtained from hydrogen sulfide in the various gases from purifications operations.

The sulfur produced is either sold for shipment in the molten form, or is flaked. Most of the production is sold to manufacturers of agricultural insecticides, and the flake sulfur is a definite advantage to them because it does not require grinding before mixing it with other ingredients. The flaked sulfur is in the form of plates approximately 1/32" thick, 1/8" wide and 1/4" long. It is very light yellow in color. A typical analysis is shown in the accompanying table.

**Typical Analysis of Sulfur Produced**

| | Per Cent |
|---|---|
| **Sulfur** | **99.977** |
| Ash | 0.010 |
| Heavy Metals | 0.000 |
| Hydrogen Sulfide | 0.002 |
| Sulfur Dioxide | 0.001 |
| Organic Substances | 0.000 |
| Moisture | 0.010 |

### The Process

A modified Claus process is used. The acid gas fed to the sulfur recovery unit averages 68.2 mol per cent $H_2S$, 30.0 mol per cent $CO_2$, and 1.2 mol per cent $CH_4$. The

unit treats about 71,000 scfh. Tail gas from the unit is predominantly nitrogen, carbon dioxide, and water vapor, with only slight traces of hydrogen sulfide. Approximately 85% of the theoretical amount of sulfur is recovered.

The feed gas is divided into two streams. One-third of the total flow is burned in the fire box of a steam boiler with the theoretical quantity of air to produce sulfur dioxide and steam. The remaining two-thirds of the total feed is mixed with the boiler's products of combustion in a catalytic reactor using a high-iron natural bauxite catalyst. Products of reaction are sulfur and steam. Flue gases from the boiler are at 700°F, while the mixed gases are at 415°F when they enter the catalytic converter.

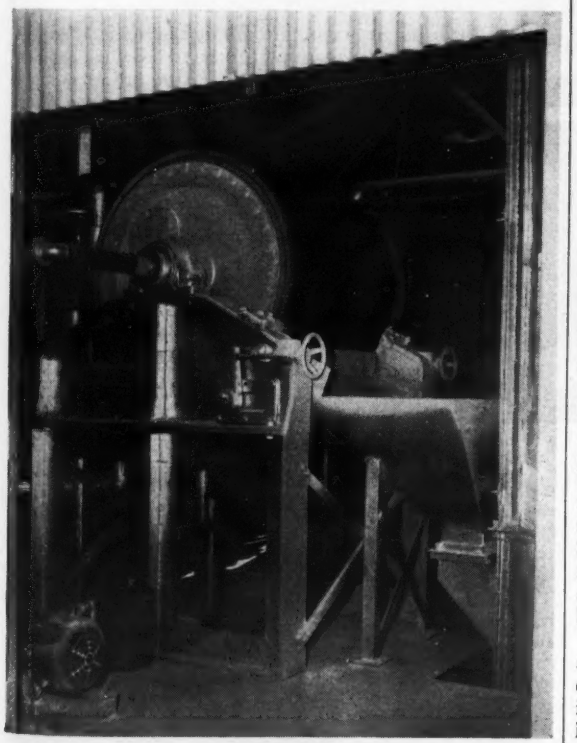
The sulfur vapors, steam, and other gases leave the converter at about 590°F and rise through a sulfur cooler, or scrubbing tower, where they are contacted with a descending stream of molten sulfur. This cools the gases and vapors, and condenses the sulfur, which is pumped to an elevated sulfur storage tank held at approximately 275°F by steam coils. Tail gas is vented at 240°F.

The method used here permits better temperature control than systems involving combustion of the entire acid gas feed stream in the fire box. It also precludes formation of carbon oxysulfide, which would result from the exceedingly high temperatures produced if the entire stream were burned.

### Sulfur Flaking and Handling

Molten sulfur can be drawn directly from the storage tank into tank trucks or tank cars. However, most of it is flaked on a water-cooled flaking drum. The 48" long by 40" diameter cast iron cylinder revolves at about one rpm with its bottom portion submerged in liquid sulfur.

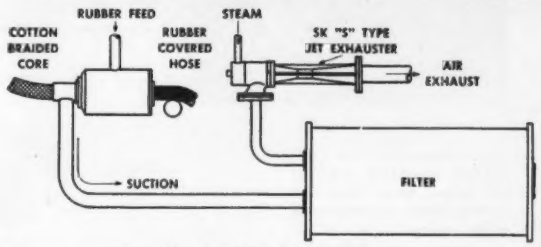
(*Continued on page* 47)



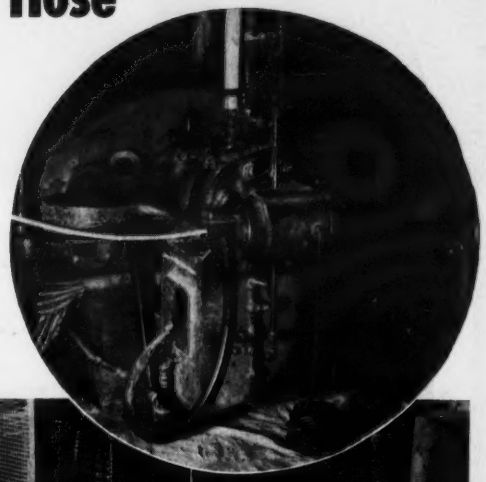
Sulfur is flaked on this water cooled drum, and is scraped off by doctor blade so that it falls through chute and directly into boot of elevator at right. This elevator carries it to flake sulfur storage bin


SK News

# Jet Exhauster Cracks Production Problem In Manufacture of Rubber Hose




This diagram shows how Thermoid Engineers applied an SK Jet Exhauster to create required suction.

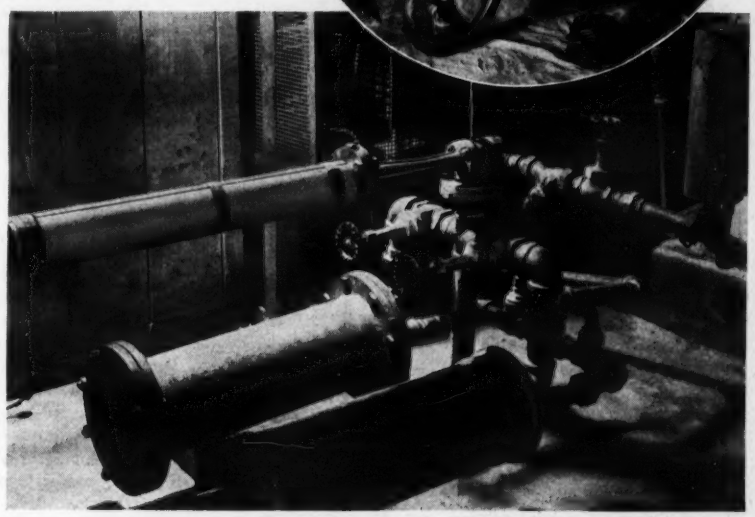


Jet apparatus, outstandingly simple in construction and reliable in performance, possesses definite advantages in priming, exhausting, evacuating, cleaning, transporting, compressing, and agitating fluids. While already widely used throughout industry, new applications are constantly being developed. Whenever possible, we at SK try to disseminate jet application information to the process industry in the hope that such material may suggest *a means* of solving problems even if not of a directly related nature.

Thermoid Rubber Company engineers recently applied an SK Type "S" Jet Exhauster to a phase of a process designed for use in manufacturing rubber hose. To the part of the manufacturing unit where plastic rubber must be drawn in and applied tightly and uniformly around a braid-reinforced rubber core, they attached a hose. This hose was connected to two filters and was then connected to the suction connection of the exhauster.

Using steam as the operating medium, the exhauster maintains consistently strong suction of 24" — 26" Hg. — sufficient to cause the rubber to be drawn into the unit and properly applied around the braid-reinforced core.

The highly satisfactory performance of the exhauster has practically eliminated production problems during this phase of the operation and has displayed great superiority over the mechanical apparatus previously used.



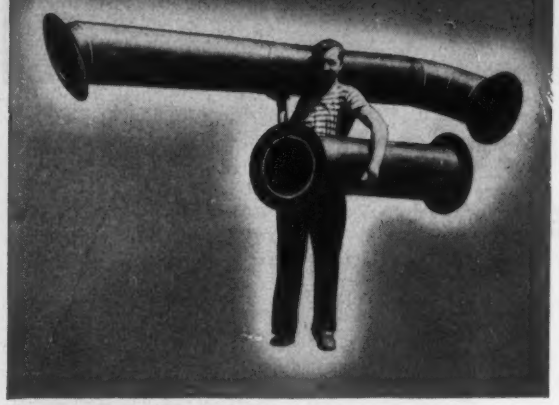
As shown above, suction, created by the exhauster (lower photo) draws plastic rubber into the unit and around the hose core.

*For our "Index of SK Products" which lists the various technical bulletins describing the many types of SK Jet Apparatus, write to us.*

Manufacturing Engineers

When inquiring check CP 5944 on handy form, pgs. 2-3

HERE AT "Agile" YOU WILL FIND



**EXPERT ADVICE** on the use of our new outstanding construction materials for anti-corrosive applications.

AGILENE (Specially Selected Grades of Polyethylene for highest corrosion resistance.)

AGILIDE (A new, completely unplasticized Polyvinyl chloride, insuring high structural strength and excellent resistance to corrosion.)

AGILEST (A series of glass reinforced Polyesters for highest structural strength and high chemical resistance.)

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We have the required knowledge to design and fabricate according to your specifications:—

Containers and Tanks, both are self-supporting structures and liners for steel, concrete and wood tanks; pipe lines and pipe installations, apparatus and equipment, such as exhaust hoods and systems, reaction vessels, acid pumps, valves, etc.

We invite your inquiries and will be pleased to furnish you literature, prices, delivery, etc. for fabrications built to your own specifications, as well as on sheets, tubing, ducting, etc.

AGILE PLASTICS

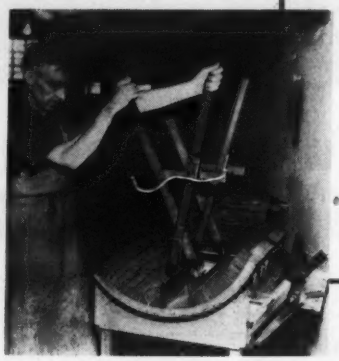
American Agile Corporation

Plant and General Offices • 5461 Dunham Rd., Maple Heights, Ohio
Mailing Address, P. O. Box 168 • Bedford, Ohio

When inquiring check CP 5945 on handy form, pgs. 2-3



# Maintenance of Heated Vessels Is Simplified by Snap-on Insulated Jackets



**Framework enclosing mineral wool boards is easily removed for access to evaporator sections of distillation units**

Fig 1—Spreading tool compresses insulation until all of strips have been inserted. When it is released strips spring back and fill jacket within flange



Fig. 2—Surface of insulation is sandpapered to smooth surface for close fit around evaporator

Illustrations show how basic insulation is installed on jacket for lower evaporator section. Upper section is handled in a similar manner. Strips 3" wide are first cut from mineral wool boards 24 x 48" and 1" in thickness. Material is rigid and at same time springy enough to wedge permanently into position.

Strips of insulation are inserted on their 1" edges in each 120° segment. Pressure is then applied with a special spreading tool. After proper number of strips have been inserted, even tension is produced which retains 3" thick insulation in place without need for external fastening. Density of mineral wool board is increased slightly when strips are installed in jacket segments.



MAINTENANCE of heated vessels is made much easier by snap-on insulated jackets which are being successfully used on evaporator sections of distillation units being produced for the US Navy. Mineral wool boards are wedged into a metal framework which is easily removed for access to operating sections of equipment. Jacket segments, which do not require further attachment after assembly, form highly efficient insulation units, which can withstand vibration and shock.

Evaporator units which are being insulated with the removable jackets are being used on board ships and other vessels for distilling sea water to make it palatable for human consumption. Distilling units are provided with snap-on insulation by the Badger Manufacturing Company of Cambridge, Mass. Two sizes of distilling units are being made, capable of handling 50 and 1000 gallons per hour. Operating temperatures of lower evaporator section range between 230 and 240°F while upper section operates at about 216°F.

Each evaporator is covered by two insulating jackets which may be separately removed for access to either upper or lower section of evaporator. Of similar design, both jackets consist of three 120° segments which are rapidly fitted together around evaporator and secured by snap locks.

Fig 3—Vertical cut is made first in fitting jacket over evaporator flanges

Fig 4—Completed jackets ready for assembly on distillation unit



Self-retaining insulation is then sandpapered to provide a close fit when in position on evaporator. Insulation is cut in designated places so that jackets fit over flanges in evaporator unit and allow connecting pipes to pass. Completed insulating jacket has smooth surface and sharply-defined contours. Only minimum maintenance of insulating units is required.

In operation of distilling units, scale forms on heated surfaces and must be removed at regular intervals. In distilling sea water, quantity and character of scale are such that operating cycles of 700 hours between cleanings are possible. Relatively pure magnesium hydroxide scale deposited on tubes is removed by two hour acid salt treatment. Removable type of jacketed insulation permits easy access to interior of evaporator.

Installation technique is adaptable in chemical processing and petroleum refining industries to insulation of many types of high-temperature vessels having similar curvature. (Courtesy of Industrial Mineral Wool Institute, Dept. CP, 441 Lexington Ave., New York 17, N. Y.)

## Swelling of small beads permits quick analysis of electrolytes

**Columns or single particle of ion exchangers may be used in determinations**

CHANGE in volume of minute beads when brought in contact with electrolytes offers a simple, quick procedure for determining the concentration and type of ions. Tool with these analytical chemistry applications was introduced at recent American Chemical Society meeting in Atlantic City, N. J. Ion exchange resin is basis of method. Measurement of variation in volume may be made on a single bead or a column of material in a tube.

Dry resin particles, smaller than the head of a pin, swell 25 to 50 times their original size when placed in water. When these beads are brought into contact with salts, acids, and alkali solutions, volume of particles changes. Amount of change depends on concentration and type of ions. Change in volume can be measured with a small column of material or with a single particle in a microscope. Method is simple and fast and needs only small volumes of solution.

Particles swell and contract reversibly. Single bead, 0.02" diameter, has been used repeatedly for about 15 consecutive tests. When dry, number of particles per cubic inch is over 500,000.

Ion exchanger may be used to analyze boiler waters, determine degree of hardness in water supply, for end point in softening runs, and pH of acid. Amount of water in alcohol solutions can be measured with extreme accuracy. Other uses include making water of distilled quality without distillation, recovery of valuable metallic wastes, purification of sugar, and separation of rare earths and elements from atomic piles. Method also has certain biological applications.

(Ion exchange method was developed by Dr. C. Calmon, Head of Research and Analytical Laboratories of The Permutit Company, Dept. CP, 330 W. 42nd St., New York 36, N. Y.)


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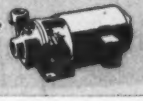
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When inquiring check CP 5946 on handy form, pgs. 2-3

# YOU CAN CUT CONTROL VALVE INVENTORIES *in half!*




**ONE ANNIN VALVE BODY FOR THREE TYPES OF ANNIN OPERATORS**

A single Annin valve body is standard for use with any of three types of Annin operators. Furthermore, each size of operator fits two sizes of valve bodies. Think how your inventory of critical control valves can be cut: For any installation the valve body is selected by size and alloy, then assembled with operator desired, and your control valve is complete (positioner unit built-in)—ready for service under specified conditions. In addition, all valve bodies carry a 1000# rating. Interchangeable flanges series 15, 30 and 60 are split-ring mounted to meet any requirement. Write today for detailed information. Ask for Catalog 1500B.

When inquiring check CP 5947 on handy form, pgs. 2-3

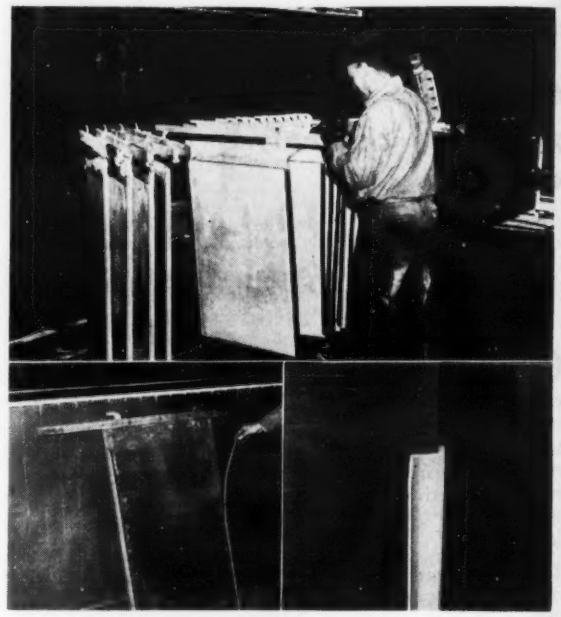



***Stripping operation is improved by using plastic channels in place of wood . . .***

permits removal of zinc from cathode without strips breaking or being attacked by acids

In order to facilitate removal of electrolytic zinc deposits from aluminum cathodes, plastic channel shapes have been substituted for wooden strips. Wood broke easily, was corroded by acids, and was subject to swelling and distortion. Plastic being used at present does not rot, is not affected by acids, does not absorb water, and is said to be flexible enough to avoid being broken. Material has a certain amount of springiness which makes for a tight snap fit on cathode.

Stripping operation is being carried on at the Electrolytic Refining Plant of Anaconda Copper Mining Company in Great Falls, Mont. Zinc is deposited by direct current



Top photo shows zinc plated cathodes on stripping rack. Plastic strips are still in place on edge of four cathodes on left section of rack. Channels have been removed from those on right as shown by dark edges revealing unplated aluminum

Picture at lower left shows cathode being readied for plating bath with plastic strips fitted on both edges. At lower right, close up is shown of flanged U-shaped plastic channel on edge of cathode

on aluminum cathodes which are suspended vertically between lead anodes in a solution of zinc sulfate. Every 24 hours cathodes are hoisted to racks where zinc deposits are removed and sent to melting furnaces for casting.

In order to enable zinc to be easily removed from cathodes, its was practice to fit a grooved wooden stick along each vertical edge. This separation of zinc deposit at edge of cathode provided a means for its removal. Since wooden strips were subject to disadvantages noted, Anaconda engineers, in an effort to improve operation, designed a channel shape with special projections. Channels were extruded in Aeroflex (polyethylene) to specifications by Anchor Plastic Company, Inc., New York, N.Y.

As described, plastic strips have a number of advantages over those made from wood. They have proven econom-

ical due to their long service life and easy strip-ability. Plastic channels have now completely replaced wood in this application.

(Information obtained from Anchor Plastics Co., Inc., Dept. CP, 533-541 Canal St., New York 13, N. Y.)

## Sulfur recovery

(*Continued from page* 43)

Sulfur solidifies on the drum surface, cooled by sprays of water on the interior, and is scraped off by a stationary doctor blade as the drum revolves.

Flaked sulfur falls through a chute into the boot of a bucket elevator and is carried up to a storage bin. It can be easily unloaded from this bin into trucks, by gravity. The bin as well as the feed boot of the bucket elevator are equipped with electric vibrators to assure continuous flow of the sulfur flakes.

Explosion-proof doors are provided in equipment handling the flake sulfur. However, very little dust is encountered in the production of flake sulfur by this method, and fires and explosions due to handling this type of material have never occurred during normal plant operations.

### Utilities

Boiler feed water for the sulfur recovery unit is obtained from the existing gas desulfurization plant system. The steam from the heat recovery boiler (the fire box of which is the place where the one-third part of the acid gas feed stream is burned) amounts to about 2300 lb/hr, at 185 psig. This steam is used to operate all drives required in connection with the sulfur recovery unit, except for the electric motors on the sulfur flaker and sulfur elevator.

Exhaust steam is returned to the natural gas desulfurization plant system, where it heats the amine solution reboiler. This cuts the load on steam generating system of desulfurization plant and also results in a saving of boiler fuel.

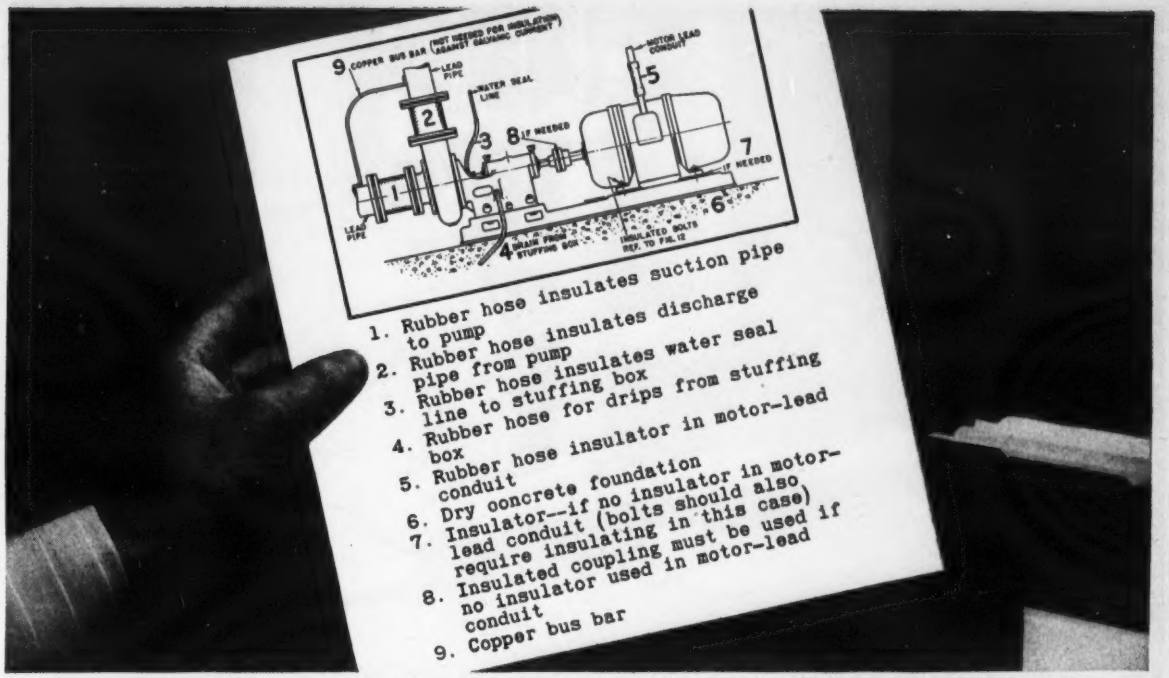
Cooling water required for condensation of the sulfur is obtained from the desulfurization plant too. The hot returned cooling water from the downstream side of the tube-and-shell coolers of the desulfurization unit is used to cool and condense the sulfur. Cooling water from the sulfur recovery unit is returned to the cooling tower serving the gas desulfurization unit.

### Instrumentation

Principal instrumentation consists of two aneroid type ratio flow controllers, which are employed to continuously apportion the one-third, two-third gas streams and the correct air-hydrogen sulfide mixture for combustion in the boiler. These controllers can be easily adjusted to compensate for changes in metering pressures, gas composition, water saturation, or the fluctuations in air density due to changes in ambient temperature and barometric pressure. Usually, little or no adjustments are necessary in the course of normal operation.

Important process temperatures are recorded on an eight-point recorder. A temperature recording controller is used for controlling quantity of cooling water to the sulfur cooler so the liquid sulfur leaves cooler at an optimum temperature, and also to prevent freezing of the sulfur in cooler.

(Engineer-contractor handling this installation was Graff Engineering and Equipment Co., Dept. CP, 3415 Westminster Ave., Dallas 5, Texas . . . or for more information check CP 5948 on handy form, pages 2 and 3.)


ANOTHER CASE STUDY FROM THE WORTHINGTON FILES. This data sheet from the Worthington files indicates points at which an alloy pump should be insulated in order to eliminate stray-electric-current corrosion in an electrolyte circulating system. The solution to this problem was arrived at from very careful consideration and investigation by Worthington engineers working in conjunction with the pump user. The resulting installation—made some eleven years ago—was one of the first in the world where alloy (Worthite) pumps were used to circulate an electrolyte.

# Another Pumping Problem That Called For More Than a Pump!

***A check of the Worthington files would uncover many stories like this one. They're the best evidence we have of the "extras" you get with every Worthite* pump.***

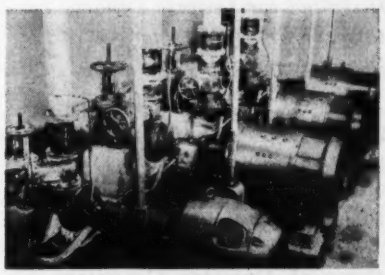
About eleven years ago Worthington specialists solved this problem of protecting pumps from stray current corrosion. As a result, Worthite pumps were installed in the manner illustrated above in the data sheet.

Today, after examination, there is practically no corrosion on the pumps. A life of 20 to 30 years is indicated for these Worthite pumps. Maintenance costs are a fraction of what they had been before. And the Worthite units required only 40 hp as compared to 75 hp for previously used (lead) pumps. They still deliver more electrolyte and have not fallen off in capacity after eleven years service.

During the same eleven years, copper and zinc refineries everywhere in the world have been specifying Worthite pumps for electrolyte circulation. Old refineries now modernize with them. Once again, Worthington's 111-year experience with pumping equipment helped to solve a tough problem for industry.

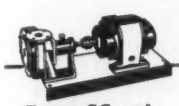
At Worthington, we'd like to hear about your pumping problems. Write Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.

*Reg. U. S. Pat. Off.



THIS ALLOY PUMP INSTALLATION FOR ELECTROLYTE CIRCULATION is comprised of these Worthite centrifugal pumps, 6-in. discharge by 8-in. suction. They circulate copper sulfate electrolyte and have been in service for eleven years without any indication of stray-electric-current corrosion. Note how pumps are insulated.

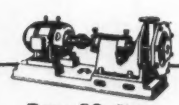
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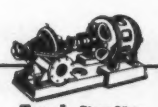
Types CG and CGL. Sizes ¾" to 10". Capacities to 5000 GPM; heads to 200 ft. Liquid ends of WORTHITE.



Type CF. Sizes 1" to 4". Capacities to 1000 GPM; heads to 130 ft. Standard, all iron and all bronze.



Type CQ. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller.



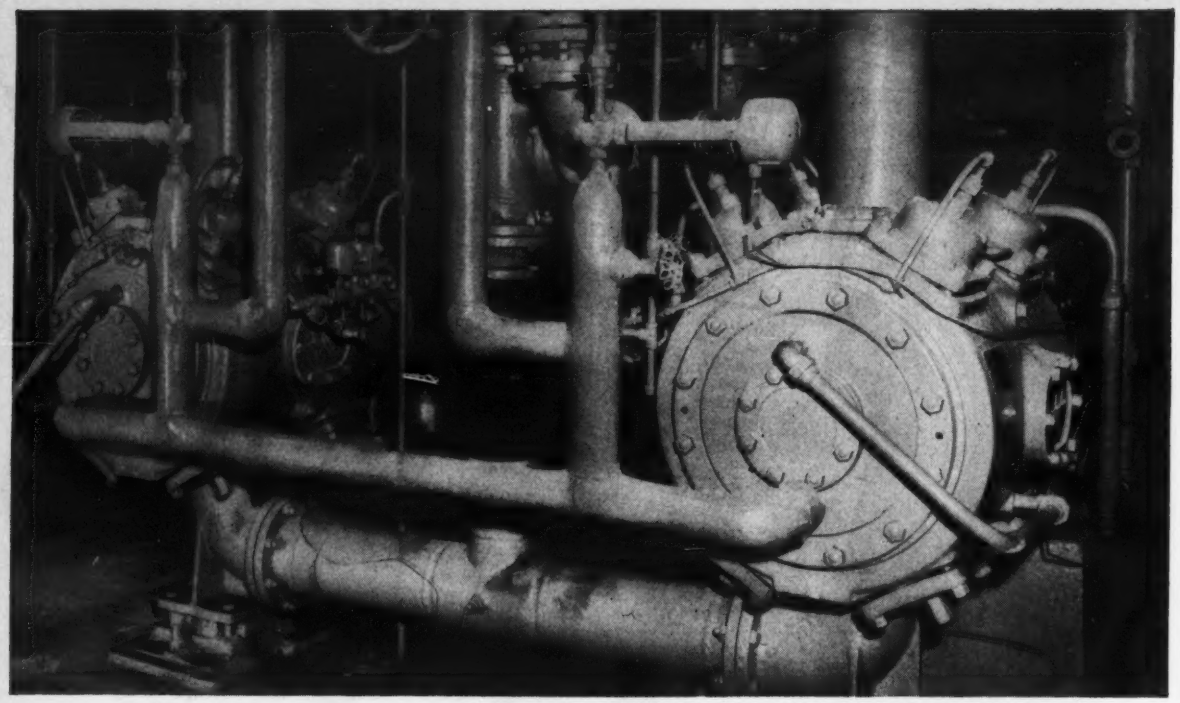
Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage volute. For general service.

The World's Broadest Line Assures You the Right Pump for Every Job

WORTHINGTON

Centrifugal Pumps

When inquiring check CP 5949 on handy form, pgs. 2-3



CONTINUOUS OPERATION of this Worthington Type DC Horizontal Compressor helps keep aureomycin production up at Lederle Laboratories plant in Pearl River, N. Y.

# Compressor operates continuously to help produce aureomycin

***Installed for Lederle Laboratories in 1949, unit operates at 100% capacity day and night.***

No rest periods for this duplex compressor. When you're producing antibiotics like aureomycin, you just can't afford them!

The Lederle Laboratories Division of American Cyanamid Company anticipated rigorous operating requirements when they installed this Worthington horizontal compressor back in 1949.

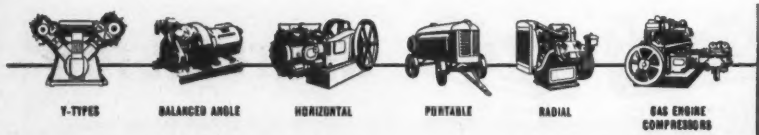
They wanted it to supply compressed air for use in the production of aureomycin—24 hours a day, seven days a week, at 100% capacity. The fact that the unit has operated since installation in 1949 with no attention other than routine maintenance is but "normal" for a sturdy Worthington compressor like this one.

This Type DC compressor has the exclusive Worthington Feather* Valve, deep, full-area cylinder water jackets, extra-large bolted gasketed clean-out covers—just some of the reasons why *there's more worth in Worthington.*

Remember Worthington's auxiliary equipment, too. Write to Worthington Corporation, Compressor Division, Buffalo, New York.

*Reg. U. S. Pat. Off.

K.2.1




**No Other Compressor Will Outperform a Worthington**

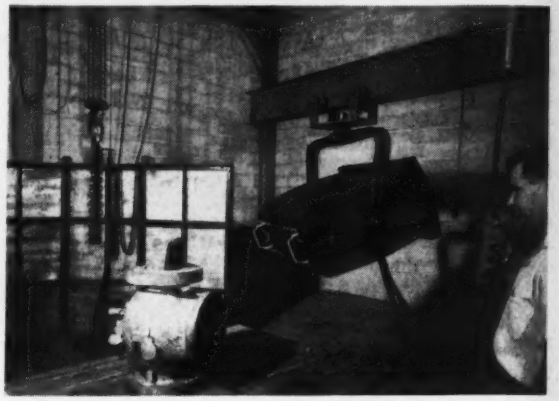
WORTHINGTON
Compressors

When inquiring check CP 5950 on handy form, pgs. 2-3

***Three-room laboratory installed for X-ray, Co-60 work . . .***

operations room is walled off with lead and concrete from control and darkroom

Cornwells Heights plant of Schutte and Koerting Company has recently installed a radiography laboratory where both X-rays and cobalt 60 are used for casting inspection. All radiation is confined to one room with 12-inch concrete walls. As a further safety measure, 1/8-inch lead sheet has been used for shielding. Interlocked safety devices stop operation if anyone attempts to enter this room.

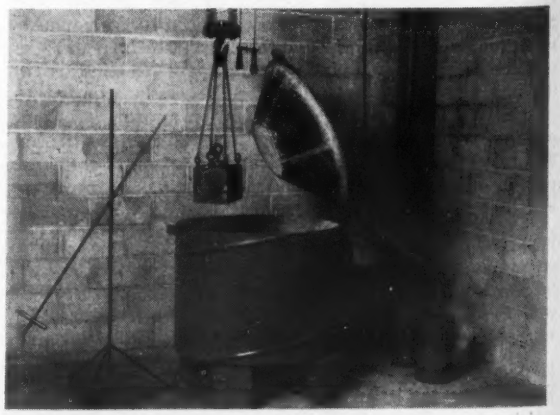


X-ray machine generates 250,000-volt radiation, penetrates castings three inches thick

Inspection operations are directed from a separate control room. A third room, the darkroom, permits exposed film to be developed on the spot.

X-ray unit provides quarter-of-a-million-volt rays and is used on castings up to three inches thick. Cobalt-60 (1.17, 1.33 mev) capsule, which is usually stored in a lead block, can handle larger castings up to seven inches thick. Inspection with either follows same general pattern. Film is attached to one side of casting and rays are directed through the metal. Developed film shows normally invisible flaws as shadows or light spots.

Company has turned to this method to supplement other inspection methods. They are also continuing to use visual inspection, magnetic field and particle techniques, supersonic equipment, and, of course, conventional hydrostatic testing. Radiography is being



Cobalt 60 (hanging in lead block) gamma rays penetrate seven-inch-thick castings

employed as another check, since their high pressure power plant equipment is used at temperatures of 1100°F (pipelines turn glowing red) where metals start to soften. Hollows, bubbles, sponginess, or cracks under these conditions could lead to very serious trouble.

(Information received from Schutte and Koerting Company, Dept. CP, Cornwells Heights, Bucks County, Pa.)

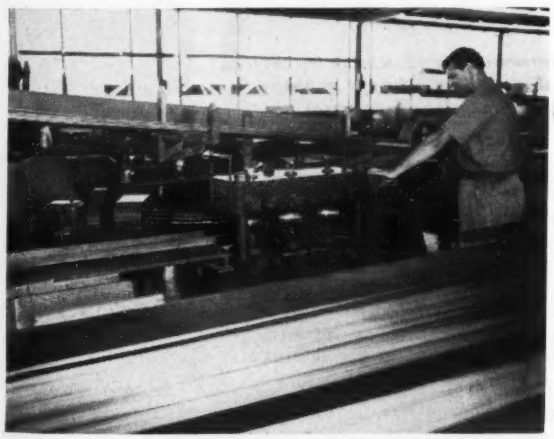
***Steel tube straightening problems solved with rotary unit . . .***

high tensile strength tubing is handled at average rate of 400,000 ft per month

Two parallel tube straightening problems have been solved by installation and operation of a Mackintosh-Hemphill Model AXY rotary unit. Straightening of rapidly growing volume of drawn steel tubing was first task. Tubing, which has tensile strength up to 225,000 psi, is being processed at Tube Methods, Inc. in Bridgeport, Pa. Second problem was to effectively straighten tubes containing alloy composition for corrosion and temperature resistance.

Although four-speed drive was added to rotary unit, company found expanding production could be paced without shifting from initial low speed setting. Monthly average of 400,000 ft of tubing has been straightened, with peak of 525,000 ft.

Special composition tubing being handled, annealed within 100°F of metal's melting point, offers more resistance to straightening than stainless steel and other



Steel tubing straightener in operation

metals. Straightener works on alloy tubing up to 7/8" in diameter. Unit handles tubes with walls as heavy as 0.095", in 20' lengths, and at production speeds averaging 150' per minute.

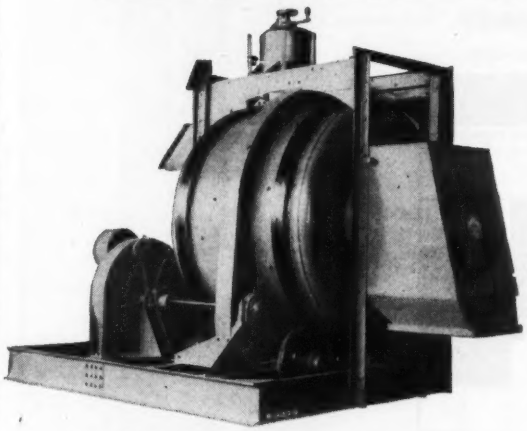
Most of stainless steel tubing being straightened on machine varies in size between 0.1875 and 0.625". Certain tubing used in aircraft engines is 1.1875" OD, with 0.032" wall thickness. In production and straightening, this stainless steel tube is held to a diameter tolerance of 0.001" per 20'. Besides use in aircraft industries for hydraulic, fuel, and de-icing lines, tubing produced by company is also used in instrument and chemical industries.

(Courtesy of Mackintosh-Hemphill Co., Dept. CP, 901 Bingham St., Pittsburgh 3, Pa.)





# He can't stand that slow mixing cycle!



A WORTHINGTON CHEMICAL MIXER, a unique machine incorporating all the features and advantages brought about during nearly a century of experience in designing and building mixers for all purposes. Chemical mixers equipped with measuring tank for use in various chemical applications. Standard sizes to 110 cu ft or 3 tons per batch.

*Hold it, bud. There's an easier way out!* We've got a mixer than can boost your daily output as much as 10 per cent. It's the *Worthington chemical mixer* with engineered blade design—a mixing action that's faster than any we know of. It saves time with every batch, mixes thoroughly, and eliminates these other big problems as well:

THE CORRODED DISCHARGE CHUTE—The Worthington discharge chute is out of the mixer during mixing time. Proper balance makes manual control of chute easy. Pneumatic controls also available.

THE WOBBLY DRUM ROLLER—Worthington drum rollers are of genuine carwheel metal, ground to exact diameter. Compensation for wear to permit perfect centering is accomplished by easy adjustment of drum-roller shafts.

THE HEAVY HORSEPOWER CONSUMER—Worthington's clean, anti-friction construction with specially designed parts assures minimum possible horsepower consumption.

YR.2.8

**SEND THIS COUPON TODAY** to learn more about how to reduce mixing time with a Worthington chemical mixer.

Worthington Corporation
Industrial Mixer Division
Plainfield, New Jersey

NAME.....

POSITION.....

ADDRESS.....

CITY.....ZONE.....STATE.....

WORTHINGTON

Industrial Mixers


When inquiring check CP 5951 on handy form, pgs. 2-3

# Do you know how many jobs this vertical turbine pump can do?

We don't—but we'd like to! We've got an idea there are lots more than you might think.

Let's first take a look at the four inherent characteristics of vertical turbine pumps that make them the versatile units they are.

1. THE DRIVE UNIT IS REMOTE AND SEPARATE FROM PUMPING ELEMENT. The pump always operates submerged. No priming. No expensive dry pits, no suction or NPSH problems.

2. SPACE REQUIREMENTS AT A MINIMUM. Because of its vertical design, the vertical turbine pump takes less floor space than other types.

3. MECHANICAL AND HYDRAULIC FLEXIBILITY. Will operate with any type of drive. Discharge can be positioned to user requirements. Can be close coupled or several hundred feet long. Meets head and capacity requirements by varying the number of duplicate stages.

4. IT'S A SIMPLE MACHINE. Uni-directional thrust minimizes alignment problems. Easy maintenance, few moving parts, little friction, long life.

Have you thought of a vertical turbine pump for your application? We'd like to hear from you, send you full information on Worthington vertical turbine pumps—newest and broadest line of its kind, built by the *oldest* manufacturer of pumping equipment.

Worthington Corporation, Vertical Turbine Pump Division, Denver 16, Colo.; Succasunna, N.J.

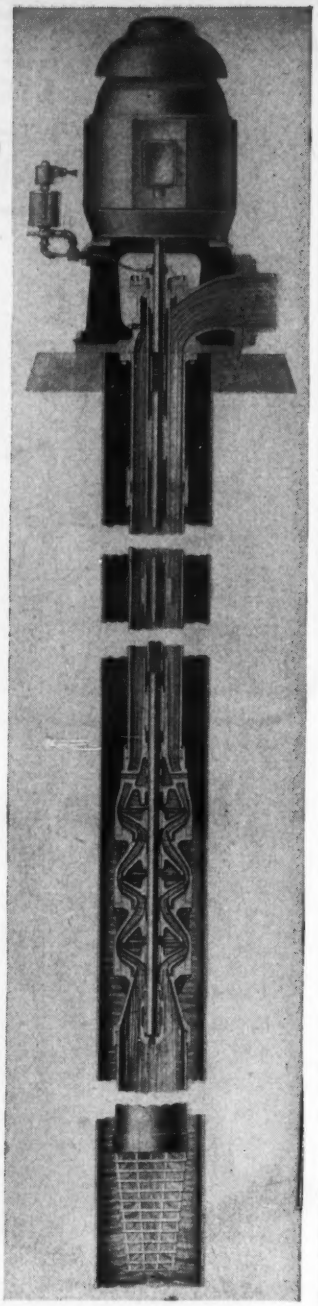
## CHECK WORTHINGTON AGAINST THE REST

Only Worthington has all 8 vital design features as standard equipment.

The Ten Leading Makes Of Vertical Turbine Pumps
✓ Indicates Feature Is Standard

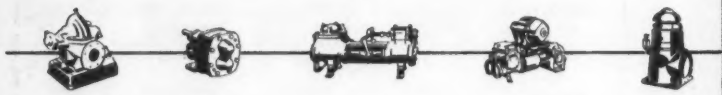
| Standard Features | Worthington | Pump A | Pump B | Pump C | Pump D | Pump E | Pump F | Pump G | Pump H | Pump I |
|---|---|---|---|---|---|---|---|---|---|---|
| Seals above and below drain ports (oil-lubricated model) | ✓ | | | | | | | | | |
| Wearing rings | ✓ | | | | ✓ | | | ✓ | | |
| Enclosed impellers | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Bronze bushings in bowl assembly | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Flanged and bolted bowls on all sizes | ✓ | | | | | | ✓ | | ✓ | ✓ |
| Sand collars at both ends of bowl assembly (water-lubricated model) | ✓ | ✓ | | | | | | | | |
| Grease-packed bottom bearing | ✓ | ✓ | | | ✓ | | | | | ✓ |
| Choice of oil or water lubrication | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | |

*The reasons why* Worthington Vertical Turbine Pumps are out in front of competition.



Typical section of the Worthington oil-lubricated vertical turbine pump that gives most efficient pumping performance at lowest possible cost.

D.1.10




The World's Broadest Line Assures You The Right Pump For Every Job

WORTHINGTON
Vertical Turbine Pumps


When inquiring check CP 5952 on handy form, pgs. 2-3

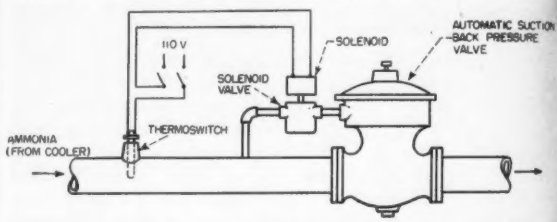


### *Prevents heat exchanger from dropping temp too low . . .*

thermostat opens $NH_3$ valve through solenoid pilot

Freezing and spoilage of product are possibilities in a heat exchanger where coolant is ammonia. One scheme to prevent this, when regular controller permits temp to fall too low, is shown in sketch below. A safety thermostat is placed in the line from cooling unit where it can sense coolant temperature before it enters heat exchanger.

Ammonia is circulated through system by suction. Thermostat is wired in series with a solenoid valve. At normal




temperatures, thermostat contacts are open, hence back pressure valve is closed. But when temperature drops to danger point, thermostat contacts close, actuating solenoid. This opens back-pressure valve and stops circulation until temperature returns to normal. At this point, thermostat de-energizes solenoid restoring suction to the line and normal operation resumes. An alarm may also be wired to thermostat.

(Thermostat used is the Thermoswitch produced by Fenwal Inc., Dept. CP, Ashland, Mass.)

### *Improved uniformity in curing of grinding wheels provided by expansion program . . .*

modernization also will increase production by 50% at Simonds Abrasive Company

Recently completed modernization and expansion program at Simonds Abrasive Company in Philadelphia will result in more uniform curing of high-speed grinding wheels manufactured there. Installation of the new equipment is also expected to increase production by 50%. Wheels, which are molded of abrasives bonded with Bakelite phenolic resins, are used throughout industry to permit high-speed grinding with safety to operators.

Although most equipment has been changed to boost production and assure uniformity, these are some of the most noteworthy improvements. Eight-deck abrasive units provide for screening of material. Wheels up to 36" in diameter are molded on one giant press. Probably the most outstanding innovation in entire expansion program is large, three-stage, car-type automatic curing oven. Danger of unbalanced wheels is lessened by improved method of forming arbor holes. Air conditioning has been extended to all vital working areas.

Improvements can best be explained by describing present process for producing abrasive wheels. Chief abrasive used is fused crystalline aluminum oxide, which is stored in silos, each of which holds one million pounds. Material passes through crushers and into electrically vibrated Hum-

For more information on product advertised at right, specify CP 5953 . . . see information request blank between pages 2-3.




# LADISH

*Controlled Quality*

# PIPE FITTINGS

## maximum service assured by metallurgical soundness

**Sound metallurgy . . . the result of unsurpassed facilities and advanced laboratory controls . . . provides the maximum of dependability in Ladish Controlled Quality fittings. Every phase of metal quality . . . composition, structure and physical properties . . . is continuously safeguarded—and certified proof of metallurgical integrity is available to users of Ladish fittings.**

TO MARK PROGRESS

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF . . . ONE RESPONSIBILITY

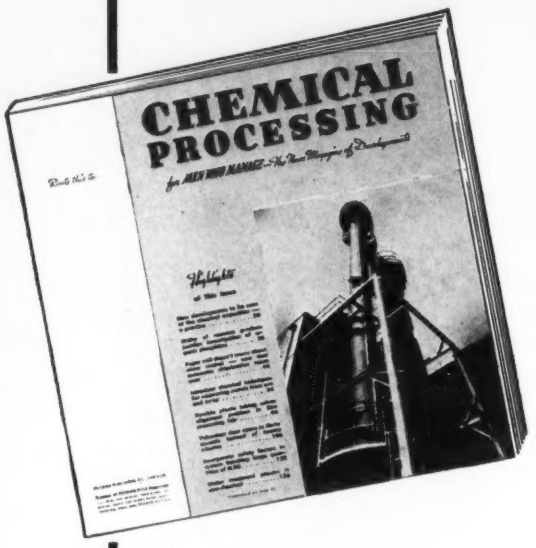
**LADISH CO.**

CUDAHY, WISCONSIN
MILWAUKEE SUBURB

*District Offices:* New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul
St. Louis • Atlanta • Houston • Tulsa • Los Angeles • San Francisco • Havana • Mexico City • Brantford, Ont.



*Have you ever wondered . . .?*




# How this magazine comes to you . . . why there's no charge for it???

Maybe, like many others, you've always thought that all publishers make their money, or much of it, from the subscriptions they sell.

**'Tisn't so . . .**

No, 'tisn't so. With the exception of a few general magazines (e.g. READER'S DIGEST) that sell hundreds of thousands — some millions of copies — most industrial publishers with relatively small circulations actually lose money on their subscription sales.

Then how do industrial publishers make money? As you can guess, they make it from the advertising they sell. Total subscription sales are hardly a "drop in the bucket" compared to advertising revenue.

**Advertisers demand best coverage**

Since advertisers pay the bills, they demand best possible coverage of **ALL** important men in the field. So it's up to the publisher to publish the most readable magazine possible . . . then to insure coverage of the maximum number of the best readers.

. . . And you can't do that by **selling** subscriptions — sales costs are high — a large share of the subscribers cancel each year — and no matter how much time, money, and pressure is used there are always some of the important men **who will never buy.**

As you can see, the most effective method of getting the kind of coverage advertisers want is (a) to handpick the most important men; (b) send the magazine to **ALL** these men; and (c) to make the magazine so interesting, so valuable that **they will want to read it.**

**That's why . . .**

That's why CHEMICAL PROCESSING is sent only to qualified readers . . . selected management and technical key-men in the food industry; that's why you get CHEMICAL PROCESSING free — that's why we spend thousands of dollars on each issue to make it **worth your time** to read it. For **you are an important reader** in the chemical processing industries.

**CHEMICAL PROCESSING**
***Published by* PUTMAN PUBLISHING COMPANY**

**Creators of PUTMAN-STYLE Magazines** . . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more READER ACTION

mer screen units for separation by grain size. These eight-deck units, such as appear in Fig 1, have capacity for screening 1,800,000 pounds of abrasive grains a month.

Hummer screens are more accurate and efficient than equipment they replaced.

Abrasives of various grain sizes are fed into tanks, from which they are drawn off and weighed. Desired quantities of phenolic bonding resins are measured through glass tubes. These ingredients are compounded in a hydraulic mixing machine with a specially-designed right-angle drive. Mixture is then blended before pressing into grinding wheel form.

Wheels up to three inches in diameter are turned out on a small automatic press at rates of 10 to 30 per minute. Medium size press molds ten-inch wheels at speeds of 6 to 15 per minute, much faster than three-minute operation

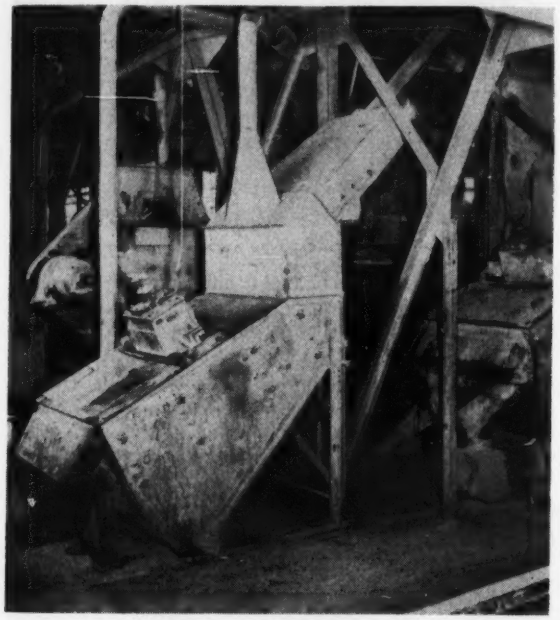


Fig 1—Eight-deck Hummer screen units for separating abrasive grain sizes

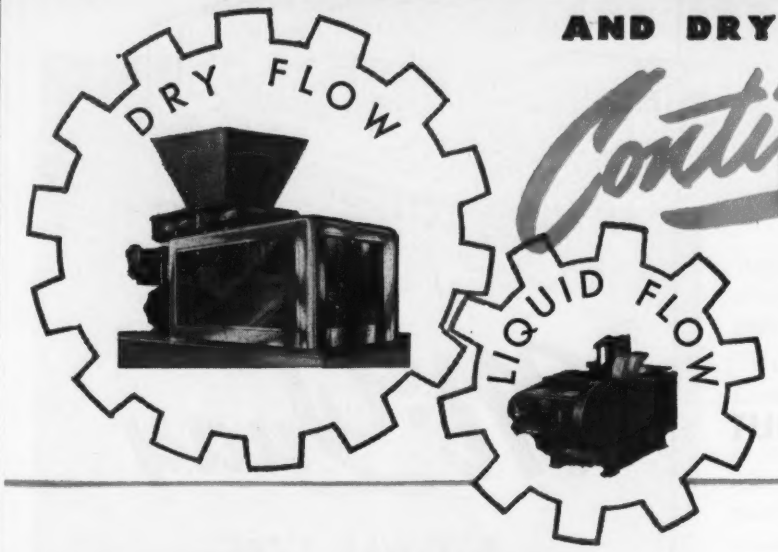
for a single wheel on hand-loaded press. Wheels up to 36 inches in diameter are shaped on 1000 ton hydraulic press, which is designed to operate almost continuously. Eventually it will have four stages to quadruple production of large wheels. Pressure in this press builds up slowly to a maximum of 2000 psi.

From presses, shaped grinding wheels go to car-type curing oven shown in Fig 2. Oven cures wheels with little variation in color, an important item from a sales standpoint. Capacity is equivalent to that of nine conventional type batch ovens. Oven is divided into three chambers. In first, temp is slowly raised from 200 to 330°F over 24 hour period. In second stage, wheels are heated for another 24 hours at 360°F. Third section is used for cooling of grinding wheels over 5 to 6 hour period. Automatic heat control built by Leeds and Northrup Co. includes 18 thermocouples located in roof and walls, any of which can be used as primary controlling element.

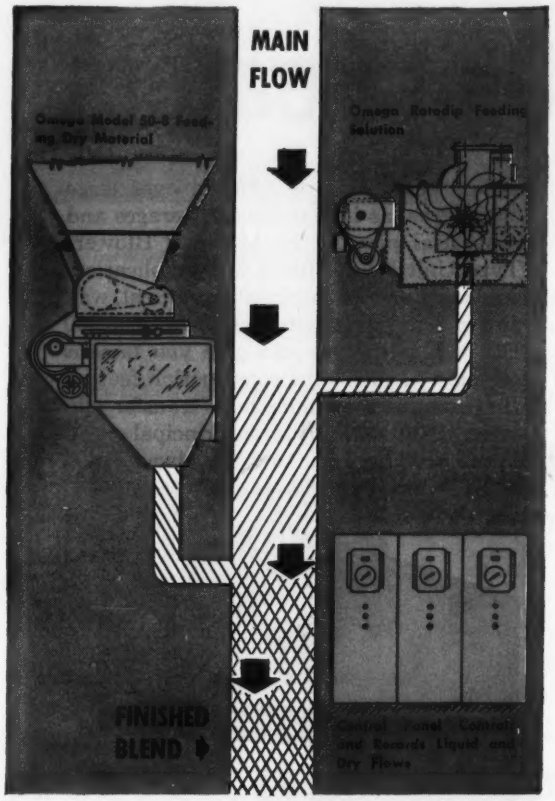
From oven cooling chamber, wheels are unloaded for finishing. First step is mounting in shot grinder, where wheels are ground to desired thickness and their sides

(*Continued on next page*)


**GEARED TO BLEND LIQUID AND DRY MATERIALS *Continuously***




**Here's how a major packer of apple products has streamlined the processing of applesauce.**




SCHEMATIC DIAGRAM OF OMEGA FEEDING AND BLENDING SYSTEM

Using an Omega Model 50-8 Gravimetric (Weighing) Feeder for feeding sugar and an Omega Rotodip Feeder-Meter for controlling the addition of water and salt solution, this fruit packer has put his complete sweetening and blending process on an automatic basis.

Because of the extremely high accuracy of both Omega Feeders, the automatic proportioning of sugar and liquid into the applesauce far exceeds manual-control methods both in accuracy and dependability. Because this integrated Omega System is continuous in operation, it keeps pace with very heavy processing schedules yet it occupies a minimum of plant floor space.

This and countless other Omega Feeding and Blending Systems are serving industry today — establishing new highs in product quality, uniformity, and productivity. From a purchasing point of view, each Omega System is a "packaged" purchase which includes all essential feeders, drives, and controls required for the application. The pre-tested Omega System arrives on the job as a complete unit, ready to swing into action the minute installation has been completed.

Whatever your processing problem is, Omega is ready to help you. Write today for engineering advice and recommendations. Omega Machine Company (Division of Builders Iron Foundry) 387 Harris Ave., Providence 1, Rhode Island.

BIF INDUSTRIES

**OMEGA**
*THE LAST WORD IN FEEDERS*

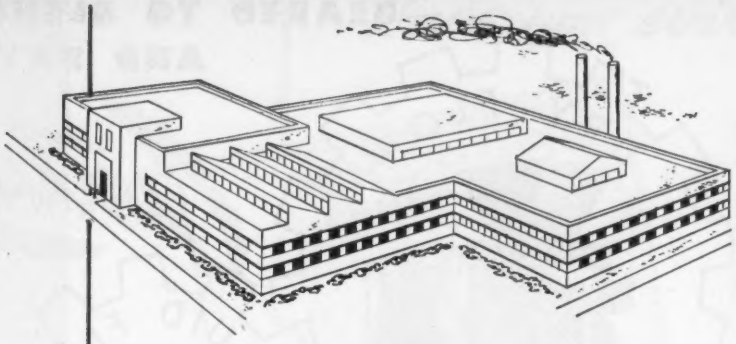
OMEGA

*Omega manufactures a complete line of volumetric and gravimetric feeders for dry materials and for gravity feeding of liquids and solutions.*

When inquiring check CP 5954 on handy form, pgs. 2-3

# Large area heating...

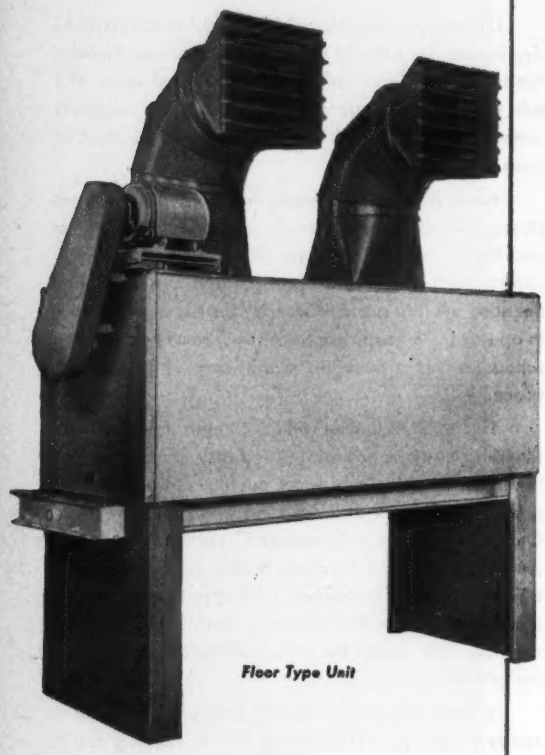
**WITH OR WITHOUT DUCT-WORK**



**McQuay**

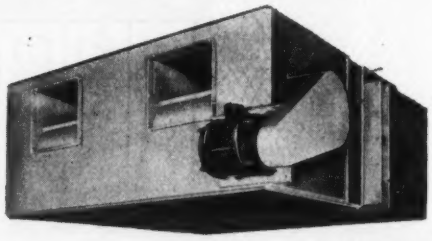
**BLOWER-TYPE**

# Unit Heaters



*Floor Type Unit*

Where heat must be diffused over large open areas, as in warehouses, garages and industrial plants, the McQuay Blower-Type Unit Heater has a wide application. Available in floor, horizontal, vertical, wall and inverted styles in 8 sizes, up to 1,600,000 Btu. Only McQuay can give you famous Ripple-Fin coils—the construction feature that assures maximum heat transfer efficiency. Representatives in principal cities. Write McQuay Inc., 1615 Broadway Street N.E., Minneapolis 13, Minnesota.



*Horizontal Unit*

**McQuay INC.**

**HEATING**
**AIR CONDITIONING**
**REFRIGERATION**




When inquiring check CP 5955 on handy form, pgs. 2-3




*(Continued from preceding page)*

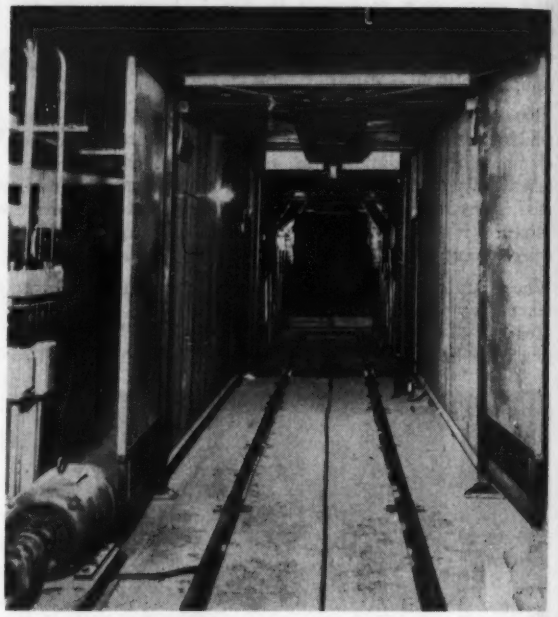


Fig 2—Three-stage, car-type automatic curing oven

smoothed. Facing machine, of different type than was formerly used, finishes sides in next step. This machine has two revolving cutters which make deep cuts accurately.

Last step is that of lining hole through center of wheel so it will exactly fit arbor, or shaft, on which wheel is mounted for use. Smooth arbor holes are speedily molded of rubber-modified Bakelite styrene plastic into rough centers of grinding wheels up to 12 inches in diameter by a recently developed Simonds method. This material

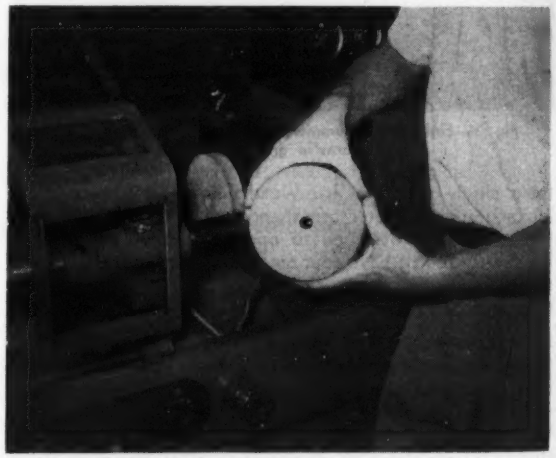


Fig 3—Lightweight plastic used in forming smooth arbor holes on injection molding machine lessens danger of unbalanced wheels

has exceptionally high impact resistance. Grinding wheel is mounted as female mold on standard injection molding machine shown in Fig 3, male mold the size of desired arbor hole being used.

This process of forming arbor holes is much faster than conventional method of pouring lead into female mold aligned with grinding wheel center. Molding material is

equally distributed, avoiding unbalanced wheels formerly caused by small build-ups of lead. Low specific gravity of styrene plastic, 1.06 compared to 11.38 for lead, contributes to wheel balance.

Finished abrasive wheels have exceptionally strong structure. They will run cool in heavy service and are safe to operate at high speeds required in industry.

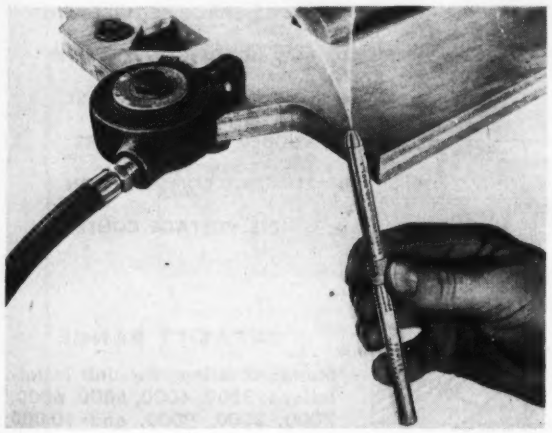
(Courtesy of Bakelite Co., Div. of Union Carbide and Carbon Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y.)

***Pocket-size device measures amplitude of vibration on machinery . . .***

indicates speed of vibration from 2000-15,000 cpm on machinery, bins, hoppers

Designed for accurate measurement of the speed and amplitude of vibration on machinery, a slide-rule type device has been made available to the industrial field.

The Vibra-Tak is 6-¼" long and has a movable tuning slide that indicates on a number scale the speed of vibration. Unit has range of 2000 to 15,000 cpm. Higher speeds register and can be closely estimated. To operate unit observer places bullet nose against vibrating object and moves tuning slide up and down



**Visual observation of "throw" of wire reed as controlled by movement of tuning slide indicates scale reading that can be converted to cpm or rpm**

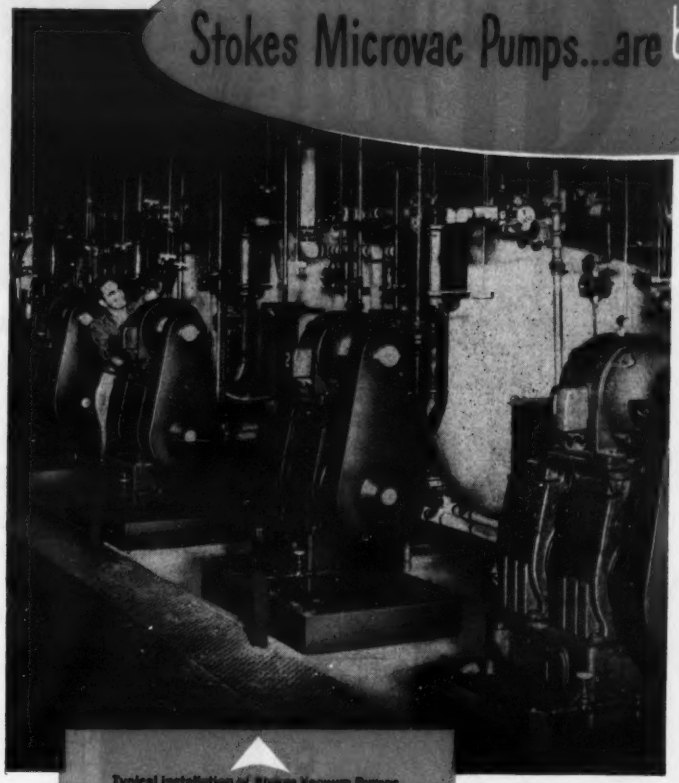
scale until wire reed, which extends out of nose as slide is moved, reaches maximum "throw." Scale reading is multiplied by 1000 to get vibration in cpm, or shaft speed in rpm. Arc through which reed "throws" is in direct proportion to amplitude.

Uses for instrument include: finding vibrations per minute; checking rpm of high speed machines, if vibration is present; and indicating amount of vibration on bins or hoppers where vibrators are installed to aid in moving materials that resist motion toward outlets of hoppers, bins, pipes, or chutes.

It is also possible to use this instrument as a device to indicate "dead" spots on equipment where vibration is induced as well as to locate unwanted vibration on other equipment.

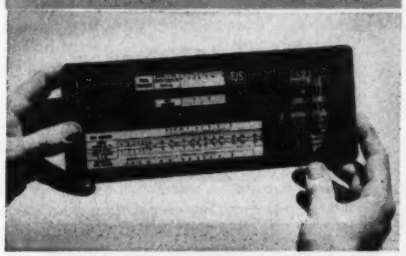
(Product is distributed by Martin Engineering Co., Dept. CP, Kewanee, Ill. . . . or for more information check CP 5956 on handy form, pages 2 and 3.)


Stokes Microvac Pumps...are basic to Vacuum Processing



Typical installation of Stokes Vacuum Pumps.

Send for new Vacuum Calculator for rapid slide-rule calculations. Includes standard ABCD log scale. Also send for Catalog 700, "Stokes Microvac Pumps for High Vacuum" with copious reference material.



High volumetric and mechanical efficiency make these famous pumps economical and reliable units in any vacuum system.

Capacities of Stokes Microvac Pumps run from 15 to 500 cfm . . . pressures to 10 microns absolute. Power consumption is low and the top-mounted motor contributes to compact design requiring minimum floor space.

Lubrication of the four moving parts (including the exhaust valve of corrosion-resistant Teflon) is fully automatic. There are no stuffing-boxes or grease-fittings, and no packing.

Parts are precision-finished, standard and interchangeable. Freedom from wear assures years of trouble-proof service.

Stokes is the only manufacturer of equipment for complete vacuum systems, including Microvac mechanical pumps, oil diffusion pumps, McLeod Gages and Vacuum Valves.

Consult with Stokes on the application of vacuum to drying, freeze-drying, impregnating, extraction, solvent recovery, evaporating, vacuum metallizing, and to other purposes for which vacuum deserves exploration.

STOKES

STOKES MAKES
Plastics Molding Presses,
Industrial Tabletting
and Powder Metal Presses,
Pharmaceutical Equipment,
Vacuum Processing Equipment,
High Vacuum Pumps and Gages,
Special Machinery

F. J. STOKES MACHINE COMPANY, 5574 TABOR ROAD, PHILADELPHIA 20, PA.

When inquiring check CP 5957 on handy form, pgs. 2-3

### *Selenium dioxide-glycerine mixture speeds resin curing time . . .*

catalyst addition also produces tension-free castings

Addition of mixture of equal parts of selenium dioxide and glycerine to phenol-formaldehyde resins considerably shortens hardening time of castings, according to claim in recent patent. At same time castings are produced that are entirely free from tensions.

Surest method of obtaining tension-free castings of this type of resin in past has been to allow them to harden slowly at relatively low temperatures.

Various procedures involving catalysts, higher working temperatures, and higher pressures have been used to speed up hardening time. Some sacrifice in quality has been required in most cases because of internal tensions which may be contained in finished products.

In present method catalyst is added to vacuum-dehydrated resin in ratio of one to four just prior to casting. Resin is then cured at 80°C. Besides providing tension-free castings in less curing time, method permits storage of resin syrup for relatively long periods before catalyst is added and resin cast.

Castings made according to this method are also claimed to have high flexural and impact strengths.

(Information received from Glycerine Information Service, Dept. CP, 295 Madison Avenue, New York 17, N. Y.

### *Sixty-four questions on plant location*

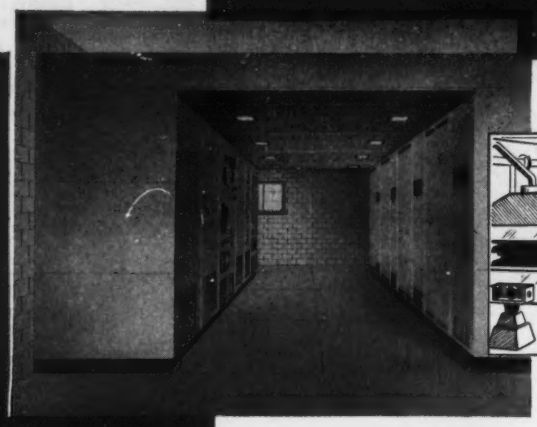
Twelve-page booklet is compilation of 64 basic questions which management must answer and evaluate in order to be sure of selecting a proper site for a new plant.

Separate section discusses in detail preliminary steps required in plant location project. Topics included in question format include production, materials, marketing, transportation and distribution, labor, supervision, utilities, service and fuels, bank facilities, laws and taxes, community attitude, living conditions, climate, national defense, and site characteristics.

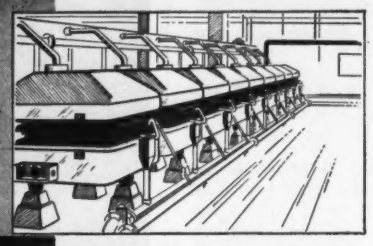
"Factors Influencing Industrial Plant Location" is issued by Walter Kidde Constructors, Inc., Dept. CP, 140 Cedar St., New York 6, N. Y. When inquiring specify CP 5958 on handy form, pages 2 and 3.

PROVED BY 33 INSTALLATIONS

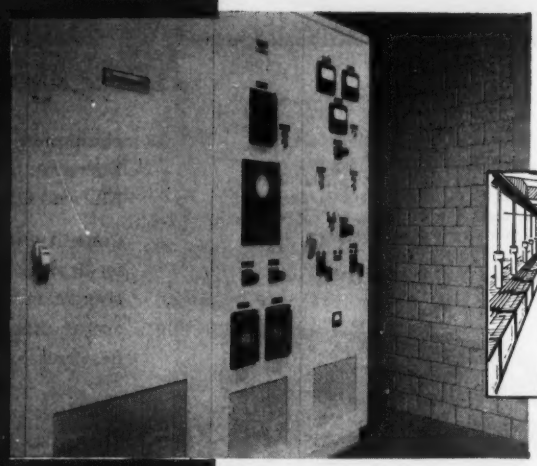
I-T-E MECHANICAL RECTIFIER

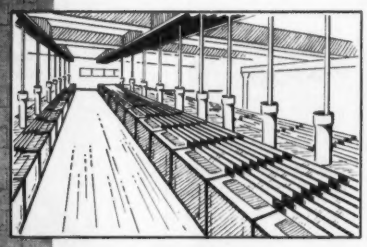


TYPICAL HEAVY-DUTY D-C APPLICATIONS

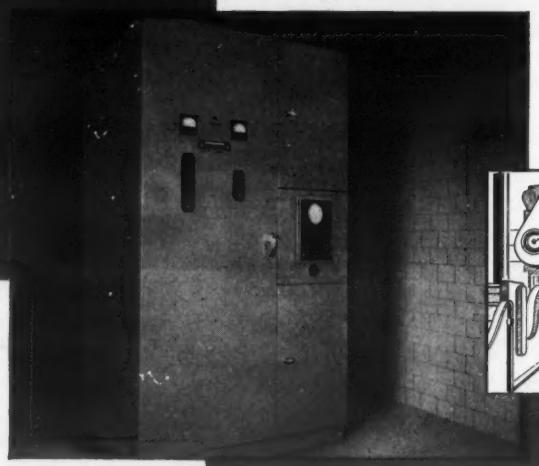


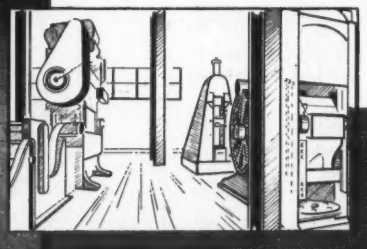
CHLORINE MANUFACTURE





METAL REFINING





ALL THESE OUTSTANDING ADVANTAGES

- HIGH EFFICIENCY
- HIGH AVAILABILITY
- EASY OPERATION
- SMALL SPACE REQUIREMENT
- LOW BUILDING INVESTMENT
- LOW INSTALLATION COST
- RUGGED TRANSFORMERS
- EFFICIENT COMMUTATION
- SIMPLE VOLTAGE CONTROL

CAPACITY RANGE

Standard ratings for unit installations: 3000, 4000, 5000, 6000, 7000, 8000, 9000, and 10,000 amperes.

Additional capacity obtained by paralleling units of suitable ratings.

Output voltage: any voltage from 50 to 400 volts d-c.

Common primary voltages: 2300, 4160, and 13,800 volts—3-phase, 60 cycle, a-c.

gives highest efficiency...

## 96%—and higher—from a-c line to d-c bus

Take the most efficient *method* for converting a-c to d-c—by mechanical switching. Then design *equipment* to get the highest efficiency obtainable with this method. The result is almost ideal rectification.

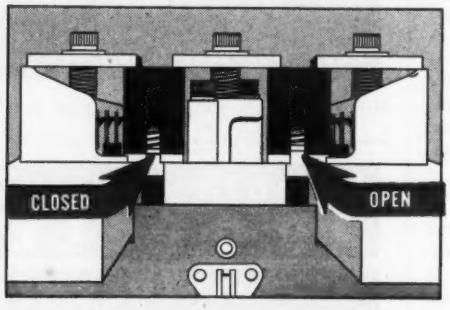
That's precisely what I-T-E engineers have done to bring you the most advanced, efficient, dependable means for converting a-c to d-c in the world today—the I-T-E Mechanical Rectifier.

The record of *33* outstanding installations to date—*120,000 amperes of connected load*—speaks for itself!

### Here's why . . .

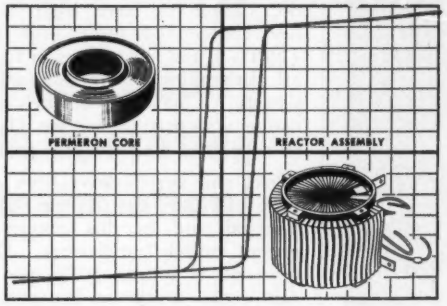
Here are the *two* fundamental reasons why these I-T-E Mechanical Rectifier users are getting 96 kw (and more) of direct current for every 100 kw of alternating current they buy:

**SOLID SILVER CONTACTS**




—held closed by powerful spring, give highest conductivity between a-c and d-c networks. 6 pairs of contacts make up basic contact system—one positive and one negative for each phase of 3-phase a-c supply.

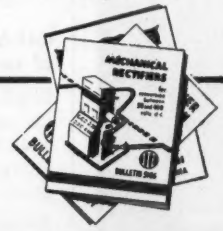
**SPARKLESS LOW-LOSS COMMUTATION**




A Permeron* saturable-core reactor—between a-c supply and contact mechanism—provides a brief period during which current in a contact is *zero!* Time sufficient for *sparkless* contact opening is gained.

**I-T-E's special saturable core material. Typical Permeron magnetization curve is shown above.*

From a-c line to d-c bus, equipment is designed to hold all losses to a minimum. The I-T-E Mechanical Rectifier serves with 96% efficiency and higher—in the voltage range between 50 v. and 400 v.—on continuous heavy-current processes. As a result, you can count on big savings—get more d-c from the power you buy.



**GET THE COMPLETE STORY—**

**Bulletin 5106**—covers simple theory, space requirements, and standard arrangements.
**Bulletin 5204**—gives details of I-T-E's special magnetic core material, "Permeron."
**Bulletin 5205**—deals with engineering aspects of I-T-E Mechanical Rectifier efficiency.
Send for your copies, without obligation, today!

I-T-E

# MECHANICAL RECTIFIERS

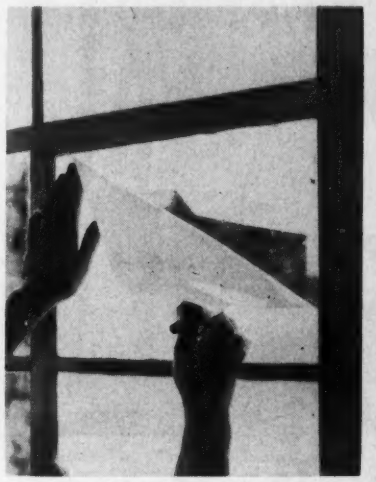


***Window shades admit sunlight without glare . . .***

plastic sheets available in eight colors; easily applied

Windows admit sunlight without glare when glass is covered with new type window shade. Shades are made of Vinylite plastic sheeting, a product of Bakelite Co. Custom cut to required size, shades are available in eight colors, from frosted translucent to blackout black, in order to admit varying degrees of glareless light.

Easily applied or removed, reuseable Anti-Glare Window Shade, 4709, is tough and strongly resistant to tear-



**Plastic shade is applied by wetting glass, pressing shade against it, and squeegeeing out the water**

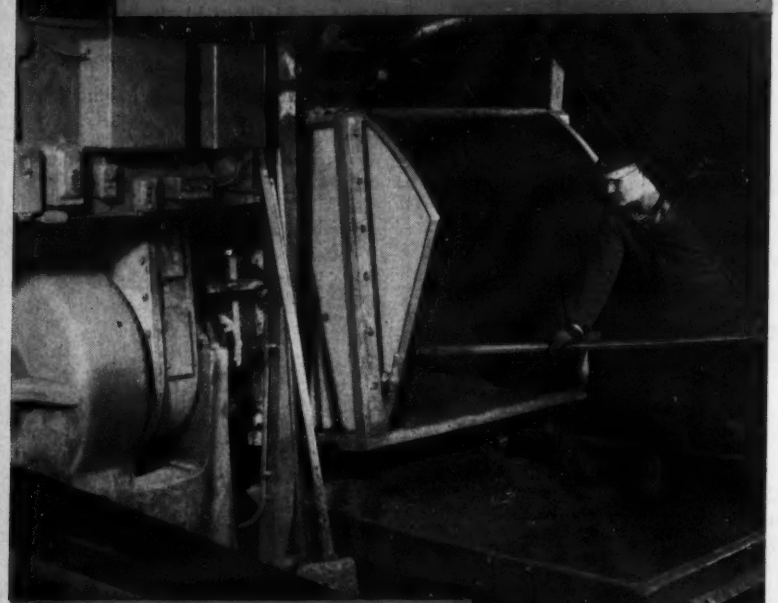
ing, abrasion, scuffing, creasing, and cracking. Plastic shade will also resist moisture, mold and mildew, oils, greases, acids, alcohols, and many chemicals.

Application consists of wetting glass, pressing polished side of shade against it, and squeegeeing out the water. Properly applied, shade will stay in place as long as desired, yet is easily stripped off by merely prying up corner. Washable on or off window, shade needs only to be rinsed in warm water to restore adhesiveness before re-use.

(Shades are products of Transeal, Ltd., Dept. CP, 821 North Ave., Plainfield, N. J. . . . or for more information check CP 5959 on handy form, pages 2 and 3.)

**For more information on product at left, specify CP 5960 . . . see information request blank between pages 2-3.**

OVER 10 YEARS AND 260 MILLION POUNDS AGO...



General Dry Batteries, Inc., installed Readco Double-Arm Mixers in its Dubuque, Iowa and Cleveland, Ohio Plants to mix depolarizer materials for its complete line of Radio, Flashlight, and Hearing Aid batteries. These mixers have been in continual use, handling capacity loads of this abrasive, highly corrosive compound without a breakdown.

Readco Mixers are designed to do a specific job. They do it well.

READ STANDARD CORPORATION

BAKERY-CHEMICAL DIVISION, YORK, PA.

LOS ANGELES 39, CALIF.

When inquiring check CP 5961 on handy form, pgs. 2-3




### *Acid resistance provided by African wood . . .*

announce supply of timber in US to replace scarce cypress

Tests of a hardwood obtained from West Africa have shown it to withstand the action of acids. Considerable quantities of the lumber have been cut up and stored in Louisville, Kentucky. This supply will help to replace scarce American cypress and pitch pine.

Available supply of acid-resisting wood has become less and less in the US. Over a period of more than ten years, a search has been made among foreign hardwoods to find acid-resisting timbers that were suitable. This wood, being introduced under name of Autracon (Autranella Congolensis), meets requirements for use in acid tanks, and beer and wine barrels.

Tests with this hardwood and others were made by Forest Products Research Laboratory in Princes Risborough, England. Their tests showed the timber to have high L-cellulose content (40.6%), high lignin (25.1%), and low pentosan (16.9%), all favorable factors for acid resistance. Conclusion of their examination was that timber would prove to have good intrinsic acid resistance.

Tanks and barrels have been manufactured from the timber, both in England and in this country, and proved entirely satisfactory. Density of wood is approx 50 lb per cu ft (air dry). Stocks in Louisville contain lengths up to 19′ and thicknesses of 1, 1½, 2, 2½, and 3″ in good widths. Lumber will be cut to smaller dimensions if desired. Small office samples are available and will be sent on request.

(Courtesy of F. Henry & Sons, Ltd., Dept. CP, 73-29 174th St., Flushing 66, New York, N. Y.)

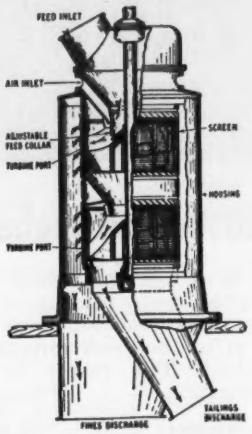
### *Cut building costs of concrete tanks*

Liquid storage constructors announce use of sliding forms to cut building costs for concrete storage tanks. Tanks are used to store chemicals, acids, oils, gasoline, water, and other liquids.

Six-page booklet shows several views of typical installations of units. Various features and stages of construction are illustrated.

Illustrated storage booklet is issued by Concrete Storage, Inc., Dept. CP, 30 Vesey St., New York 7, N. Y. When inquiring specify CP 5962 on handy form, pages 2 and 3.


GET *More* SIFTED PRODUCT WITH *Less* FLOOR SPACE




When you use centrifugal force instead of gravity, as effectively utilized in the

ABBÉ TURBO SIFTER

...here's what you can count on, production-wise...

- Faster sifting...2-10 times faster, depending on material.
- Much less floor space... up to 75% saved.
- For any material . . . any mesh.
- Cleaner, more complete separation.
- Economies in both labor and power.

- Better dispersion of ingredients...particularly colors.
- Suitable corrosion and/or contamination resistant construction.

*Write for Bulletin 65—it has all the details.*

ABBÉ ENGINEERING CO. 46 CHURCH STREET NEW YORK 7, N. Y.

Makers of ABBÉ ENGINEERING Ball, Pebble and Jar Mills

When inquiring check CP 5963 on handy form, pgs. 2-3

Smooth Vibrationless PROPELLERS

for MIXING, STIRRING AERATING, PUMPING AGITATION



A Michigan 34" Stainless Steel propeller with split hub for mounting in receptacle through manhole.

Manufactured by an exclusive process, Michigan propellers are perfectly balanced to avoid whip and strain on shafts. They are available for original equipment, replacement or special application in a wide range of materials and in sizes up to 60". Write for latest data folder.

MICHIGAN WHEEL CO.
GRAND RAPIDS 3, MICHIGAN

When inquiring check CP 5964 on handy form, pgs. 2-3

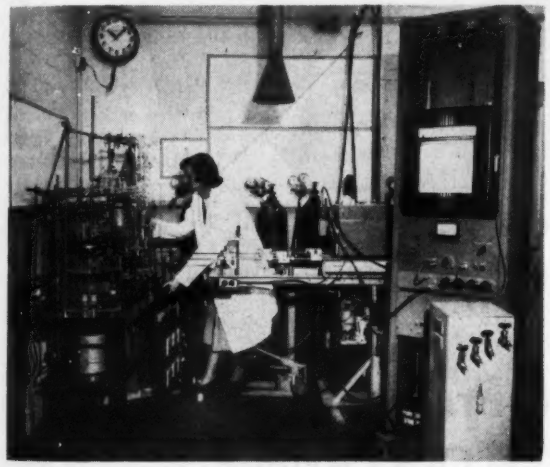
***Rapid method uses heavy water to determine water content of variety of materials . . .***

method accurate to 0.5%; analysis can be carried out in less than 30 minutes

A method which uses heavy water to determine the total water content of a variety of materials, ranging from biological to inorganic, has been recently developed by Drs. H. J. Morowitz and H. P. Broida of the National Bureau of Standards, in connection with a program of basic instrumentation. Method is based on a spectroscopic measurement of ratio of ordinary to heavy water in a solution containing the sample. Procedure may be applied rapidly, as well as conveniently, to a large number of samples.

Determinations have been made on water of hydration of inorganic crystals and proteins, water exchange in resins, moisture in the atmosphere, and structure of unknown organic molecules.

Essentially the NBS technique consists in dissolving known amount of material to be analyzed in mixture of deuterium



Operator determining total water content of material, using rapid spectroscopic method. Discharge tube, monochromator, and photoelectric recorder are assembled for analysis

oxide (heavy water) and ordinary water. The resulting change in the ratio of deuterium oxide to ordinary water is determined spectroscopically. From difference in this ratio before and after addition of sample, water content of sample material is computed (sample is assumed to contain no deuterium oxide).

After sample is dissolved in deuterium oxide-ordinary water mixture, solution is allowed to come to equilibrium. Vapor from solution is continuously pumped through a discharge tube (left in photo). The various lines emitted in the electrodeless discharge are picked-up by scanning monochromator (right of center in photo), and their intensities are traced on photoelectric recorder (extreme right).

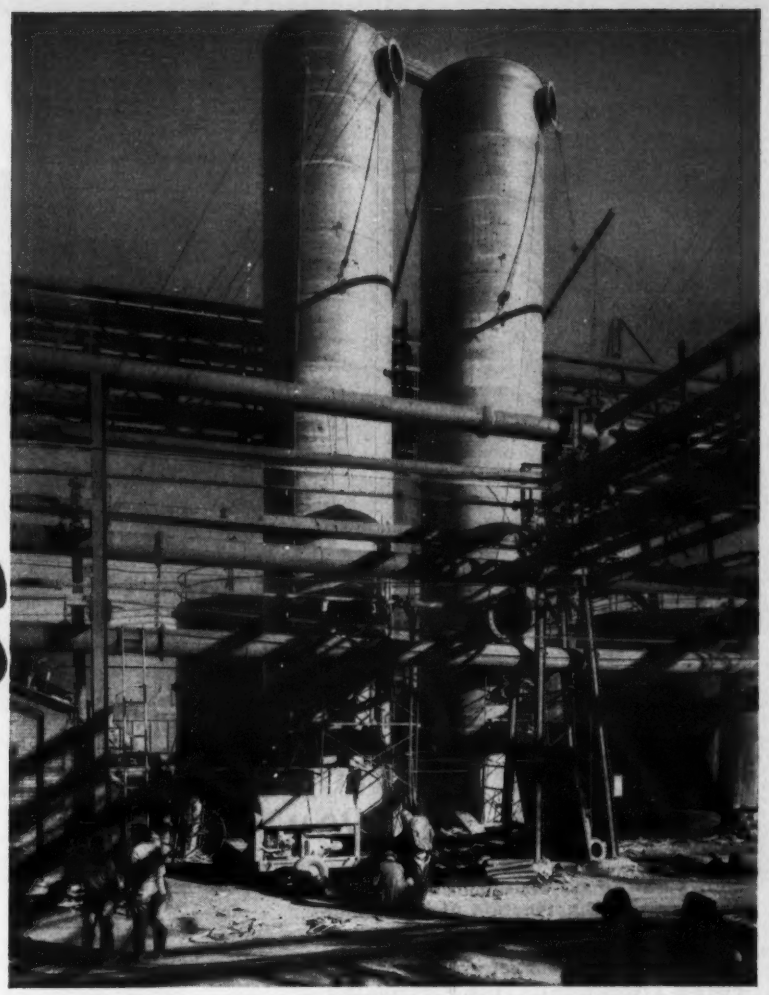
An entire analysis can be carried out in less than 30 minutes with accuracy of 0.5% in determination of water content. Procedure is applicable to any materials which contain a small, well-defined number of labile hydrogen atoms.

(Information received from National Bureau of Standards, U. S. Dept. of Commerce, Washington 25, D. C.)


56-Foot
Cooling Towers

60 days

from inquiry
to operating
installation!



Primary and secondary cooling towers, 10½ feet inside diameter and 56 feet high, as erected and ready for connection to the by-product recovery system of a midwestern coal coking plant.

**A.O.Smith** manufactures plain as well as complex vessels for customers around the world. The plain vessel takes less time to build, as indicated by the short interval of 60 days that elapsed from the time the customer's inquiry was received to the day the cooling towers went into operation.

**The cooling towers** were built from the customer's blueprints, in cooperation with A. O. Smith engineers. They are thin-wall, low-pressure vessels, field erected by our customer, within a maze of piping, where field welding united the sections.

**Gases** from the coking ovens are now being cooled in the two stages provided by these towers. Increased production of the by-product coke plant is now a reality.

**A. O. Smith** welcomes every opportunity to consult with you on vessel requirements for your processing.

**Research** and engineering teams, supported by data and vessel-design experience, accumulated through more than 75 years, can solve your vessel problems and aid you in your processing plan.

**Your inquiries** will receive prompt and expert handling.

INDUSTRY COMES TO A. O. SMITH
WITH HEAT EXCHANGER PROBLEM'



Research and Engineering Building

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VESSELS • HEAT EXCHANGERS
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Seattle 1 • Tulsa 3 • Washington 6, D. C.
International Division: P.O. Box 2023, Milwaukee 1, Wis., U.S.A.

When inquiring check CP 5965 on handy form, pgs. 2-3




# PUT THIS 52-PAGE CATALOG TO WORK FOR YOU

**Shows how to cut costs with unique thermostat . . . gives detailed explanation of installations . . . pictures wide variety of applications . . . a *fact-filled* guide.**

Send today for your copy of this 52-page catalog on Fenwal THERMOSWITCH thermostats.

Learn how you, too, can cut costs in controlling humidity, radiant heat, pressure, vapor level, or other variables dependent on temperature.

Catalog gives complete explanation of the unique operating principle of Fenwal controls. Includes schematic diagrams — detailed breakdown of specific features — instructions on checking system under operating conditions — an entire section on selection and application of THERMOSWITCH controls.

Detailed specifications on all Fenwal products include modifications, special features, exact installation instructions with diagrams on installation — plus photographs of installations illustrating wide variety of applications.

You will find the Fenwal Catalog #400 a gold mine of helpful information. For your free copy, simply write Fenwal, Incorporated, 2411 Pleasant Street, Ashland, Massachusetts.

Fenwal

**THERMOSWITCH®**

**Electric Temperature Control and Detection Devices**

***SENSITIVE...but only to heat***

When inquiring check CP 5966 on handy form, pgs. 2-3








Reflection head is held against digester side for a spot check

Long handle and roller permit head to be moved along wall. Recorder (center) shows thickness at every point

# Paper Mill Dodged Problem Of Chipping Out 20,000 Bricks To Find Corroded Areas

**Radiographic survey located danger spots in 40 hours, had plant back in production in about two weeks**

PROBLEM: At Anglo-Canadian Pulp and Paper Mills, Quebec City, Canada, two sulfite pulping digesters were out of service because of suspected serious corrosion. Used in cooking wood chips to pulp, the pressure vessels were 58 feet high, 16 feet in diameter, built of 1¼-inch steel plate lined with a double layer of brick seven inches thick. It was considered impossible to determine how bad the corrosion was without chipping out the 10,000 bricks of each lining. A long shutdown was indicated.

Solution: On a Monday night, Dr. C. J. Mackenzie, president of Atomic Energy of Canada, Ltd., made a radio broadcast touching on radiographic corrosion surveys of digesters. Anglo-Canadian officials had previously heard of the method and this broadcast induced them to investigate.

By Wednesday night arrangements had been made for the survey. And by the following Friday noon, work was in progress. Using a "gammagage" they circled digesters horizontally. Gammagage is an instrument which directs gamma rays of cobalt 60, iridium 192, and other radioactive elements through metal or other materials. It measures wall thickness by automatically determining amount of ray absorption in transmission or reflectance. Readings are instantaneously indicated and recorded on a portable strip-chart recorder. Instrument requires neither a smooth surface nor an electrical contact since measurement depends solely on absorption of gamma rays by atoms of metal wall.

Reflection head instrument, which they used, operates satisfactorily on steel from 1/16 to 1¼-inch thick or an equivalent amount of other material. Lagging up to 2 inches

thick does not prevent operation. Accuracy of reading is about 2% over most of the range. Unit may even be used with pipes if they are over 4-in OD.

Transmission head equipment is even more versatile. It is accurate to ½ of 1% over its entire range of 0 to 4 inches of steel or its equivalent. It will distinguish a shallow pit of ¼-inch diameter.

By the following Tuesday, examination of the digesters was completed. Having taken readings in complete circles every two feet, they transferred their results to blueprints of the digester wall. Bricks were removed at several points where corrosion was indicated — and actual corrosion was found to check with gammagage results.

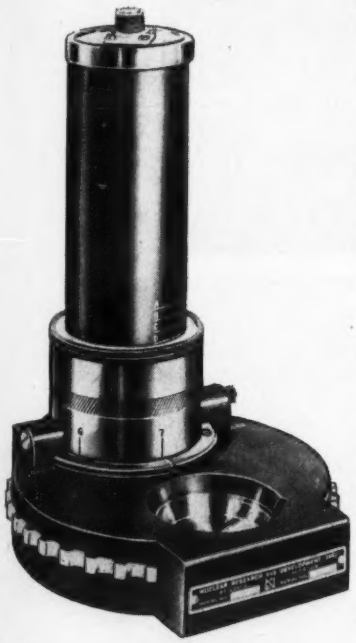
Thirteen days later Anglo-Canadian wrote, "we have received official confirmation from the boiler inspectors that we will be able to operate [the two] digesters at reduced pressure and it is expected that . . . patching of the lining and curing will be completed this week." .

**Results:** It took approximately 40 hours for the "gammagage team" to completely inspect and profile both digesters. Alternative would have involved pneumatic drilling out of 20,000 special bricks and relaying new bricks after examination of the shell.

(Information received from Isotope Products Limited, Dept. CP, Oakville, Ontario, Canada . . . or for more information check CP 5967 on handy form, pages 2 and 3.)

***Rotating disc changes counter from alpha to beta to gamma sensitivity quickly . . .***

scintillation counter can embody neutron-sensitive phosphors as well



Basic unit is here mounted on windowless alpha, beta, and gamma head. Rotating disk changes counter from one type to another

**Uses:** can be used as counter on all sorts of radioactivity. Should be especially useful where quick change is needed or where type of radiation must be identified.

**Features:** Rotating disk carries phosphors to respond to alpha, beta, gamma, or neutron radiation — phosphor can be quickly changed by rotating disk.

**Description:** Actually, a wide variety of counting heads can be attached to the phototube housing of this counter. These five types are currently standard:

1 — windowless alpha, beta, gamma planchet
2 — three-position turret (any combination of alpha, beta, gamma, neutron phosphors)
3 — Collimated medical head

(*Continued on page 62*)


VISCOSITY DETERMINATION AND CONTROL Made as Easy as . . . A B C





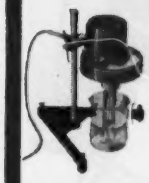

**UL ADAPTER**

When attached to LV models of the Brookfield Viscometer, the Brookfield UL Adapter, consisting essentially of a cylindrical spindle mounted symmetrically within a concentric tube, provides amplifying effects which make possible measurements to within .2 millipoises in the ultra-low viscosity range of .2 to 10 centipoises.



**HELIPATH STAND**

When used in conjunction with a suitable Brookfield Viscometer fitted with a special bar-type spindle, the Brookfield Helipath Stand lowers the rotating spindle through the test material, making possible the testing and study of highly plastic materials such as grease, putty, shaving cream, gelatin, shortening, etc.



**LEVELING STAND**

Designed to provide firm, easily-leveled support for a Brookfield Viscometer when used either by itself or equipped with a UL Adapter, the three-point screw-leveled base and adjustable elevation clamp of the Brookfield Leveling Stand insure fast set-ups and trouble-free determinations.

BROOKFIELD
VISCOTROL



**Makes Possible Continuous and Automatic Viscosity Control**

Based on the same simple yet highly accurate operating principles employed in the portable Brookfield Synchro-Lectric Viscometer, the Brookfield Viscotrol is designed for use where viscosity variations during production normally occur only in one direction. When installed in such tank, vat or pipe production systems, the Brookfield Viscotrol continuously measures the viscosity of the material in process. If a variation occurs, the unit automatically activates danger signals and/or other viscosity controlling devices. *Write today for Data Sheet 012.*

*Save Time, Labor, Dollars!*

**WITH BROOKFIELD INSTRUMENTS**

Precision manufacturing and sturdy design, combined with ingenious application of the old and simple principle of measuring with a calibrated spring the torque on a spindle rotating at a constant speed, have resulted in Brookfield instruments becoming the standard the world over for the accurate, fast and direct determination of viscosity and related properties. *Use the convenient coupon below.*

Brookfield
ENGINEERING LABORATORIES, INC.
STOUGHTON, MASSACHUSETTS

**Brookfield Engineering Laboratories, Inc.** A
**Stoughton, Massachusetts**

Gentlemen:

Please send me the literature items I have checked below:

☐ Fully illustrated catalog showing all portable Brookfield Viscometers and accessories.

☐ Brookfield Viscotrol Data Sheet 012.

Name:_____

Address:_____

When inquiring check CP 5968 on handy form, pgs. 2-3

***Meter's improved clamp cuts errors from 10% to 2% . . .***

single instrument covers ranges from 7.5 to 750 amp

**Uses:** Combination clamp-on ammeter and voltmeter.

**Features:** Use of dove-tail joint in place of conventional butt, cuts possible error from 10% to 2%.

**Description:** Redesigned clamp-on volt-ammeter embodies a pointer stop mechanism and provides higher scales than conventional models. Five current scales are available and may be selected with thumb switch: 0-7.5/30/75/300/750 amp. Clamp



**Magnetically shielded**

type meter, of course, permits readings on insulated or uninsulated conductors alike.

Three voltage scales (0-150/300/750 volts) can be used with test leads and clips.

Magnetic shield of the instrument reduces pickup from nearby lines not under test. 500 amp, for example, in a line only one foot away has a negligible effect on readings in the 300 and 750 amp range. Error on lower scales, under these conditions, is less than 1%.

(Model AK-17 Ammeter was developed by General Electric Company, Dept. CP, Schenectady 5, N.Y. . . . or for more information check CP 5969 on handy form, pages 2 and 3.)

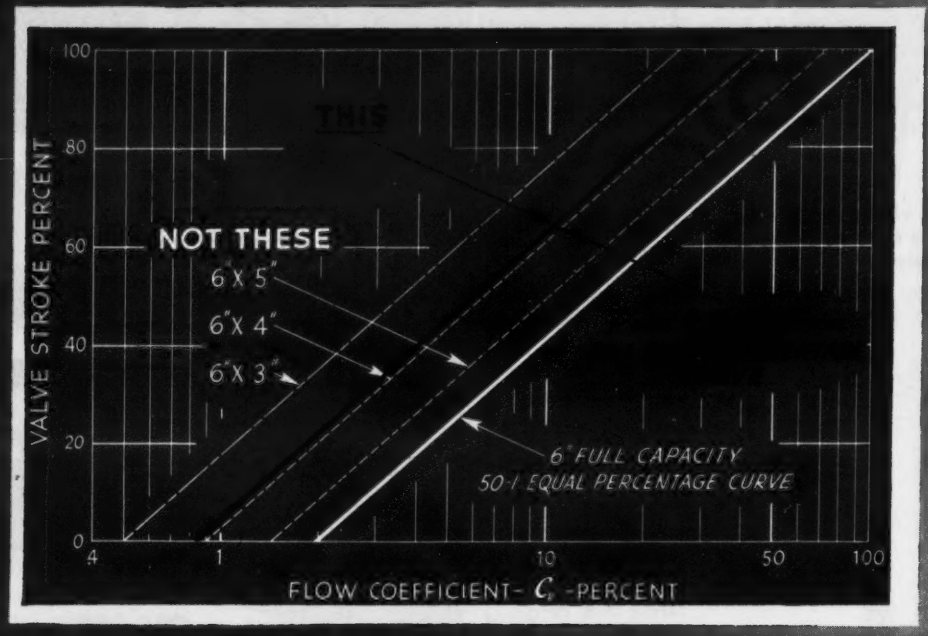
***Moves from one spot to another providing heat control . . .***

or controller may be used to run blowers, etc, from temp signal

A series of three portable temperature controllers is now in production. The three models differ in their mode of control:


# One Size, Not Three

## Masoneilan *Point 4 Factor Trim* offers the ONLY realistic approach to selection of reduced capacity trim




**It is a DEMONSTRABLE Fact** that for a given size top-and-bottom guided valve only one size reduced capacity trim is:

*Desirable* from an engineering standpoint because . . .

(a) properly designed wide-range valves with full capacity trim will handle a vast majority of control problems.

(b) if any reduction is required, it must be substantial to be of any advantage.

(c) any sound design must be based on a reduction in seat ring diameter.

(d) rule-of-thumb trim reductions based on nominal *pipe* sizes are unnecessary and merely complicate the sizing problem.

*Practical* from manufacturing and operating standpoint because . . .

(a) mechanical strength is retained with standard guide and stem diameters and standard stroke, in combination with maximum reduction in seat diameter.

(b) reduction in number of parts simplifies stock problem.

(c) forged and cast forms insure complete uniformity of parts.




MASONEILAN

*Point 4 Factor Trim*

**is the answer to those few types of applications where reduced capacity trim is required. It is available in V-port and solid turned designs for double or single seated Valves (sizes 1¼" through 12") and in a wide variety of materials.**

**MASON-NEILAN**
**Regulator Co.**

1203 **ADAMS STREET, BOSTON 24, MASS., U. S. A.**

*Sales Offices or Distributors in the Following Cities:*
New York • Syracuse • Chicago • St. Louis
Tulsa • Philadelphia • Houston • Pittsburgh
Atlanta • Cleveland • Cincinnati • Detroit
San Francisco • Salt Lake City • El Paso • Boise
Albuquerque • Charlotte • Los Angeles • Denver
Appleton • Corpus Christi • New Orleans
Louisville • Birmingham
Mason-Neilan Regulator Co., Ltd.
Montreal and Toronto

A HIGH $C_q$ PRODUCT






Controls 1700 watts

**Model JE on-off control**
**Model JEP proportioning control**
**Model JEL high limit or on-off control**

Controllers can be put in action by merely plugging power cord into wall outlet and plugging heater into the controller. Instrument's thermocouple may be placed in oven, bath, thermocouple well, etc.

True temperature is indicated by a pointer at top of temperature scale; set point is selected with a knob which positions pointer along lower edge of temperature scale. All models have dual scale ranges of 50-500°F and 0-2000°F. Lower range requires use of iron-constantan thermocouple; upper, chromel-alumel. Selector switch indicates which range is in use. Both thermocouples are provided with the instrument.

Two power outlets allow controller to operate heaters, blowers, fans, or agitators. Controller automatically cuts power if thermocouple circuit is broken for any reason.

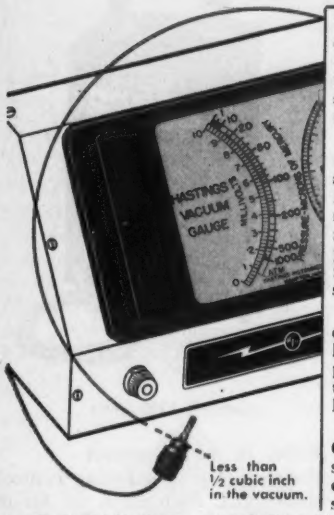
Controllers employ magnetic amplification rather than vacuum tubes, hence there is no warm-up. Pilot lights indicate whether instrument is heating or cooling the controlled unit. Output relay of the instrument can handle 1700 watts, thus seldom requires an external contractor.

(Portable Gardsman Controller is a product of Taco West Corporation, Dept. CP, 525 N. Noble Street, Chicago 22, Ill. . . . or for more information check CP 5970 on handy form, pages 2 and 3.)

**For more information on product at left, specify CP 5971 . . . see information request blank between pages 2-3.**

## Contamination, Corrosion and Outgassing Free!

### VACUUM MEASUREMENT IN THE MICRON RANGE




The Hastings Vacuum Gauge gives continuous direct readings in microns of mercury — *without* range switching or calibration factors. Only one control knob is needed for initial setting. After that, the calibration holds indefinitely, regardless of pressure changes.

The stability and wide range of this gauge (1 to 1000 microns) makes it extremely suitable for both laboratory and production use in vacuum tube manufacture, distillation, automatic exhaust machines, dehydration and refrigerator servicing. Its rapid response to pressure changes makes it especially suitable for leak detection, warning devices and pressure operated controls.

Hasting's exclusive noble metal thermocouple design gives accuracy, long life and a low operating temperature. This construction prevents fluctuations due to ambient temperature changes and reduces the time constant to less than 1/2 second.

Write today for free literature and prices. Other Hastings ultra sensitive precision instruments include electronic flowmeters, manometers, air velocity meters and electronic standard cells.

## HASTINGS INSTRUMENT COMPANY, INC.

HAMPTON, 31 VIRGINIA

DESIGNERS AND BUILDERS OF RAYDIST AND SPECIAL ELECTRONIC, ELECTRICAL, AND MECHANICAL INSTRUMENTS

When inquiring check CP 5972 on handy form, pgs. 2-3

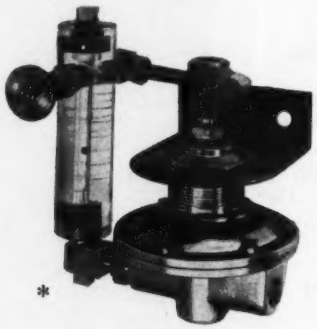


## BROOKS-MITE PURGE METERS

**. . . for metering low flow**

**SPECIFICATIONS**

One-piece acrylic plastic body with integral metering tube.
Top and bottom cleanout connections.
Built-in Flow-Mite needle valves with O-ring seals.
Safe working pressure 100 lbs.—Safe working temperature 180°.
Good chemical resistance; chlorine, photographic solutions, principal acids.
Flow rates: 0.2 CFH to 3 CFM of air; .01 GPH to 3 GPM of water.



**TYPES AVAILABLE**

Single tube units with round or square bodies. Multi-tube units—2, 4, or 6 tube with or without manifold inlet. *Purge assembly with Conoflow Fixed Differential Relay for maintaining fixed pressure differentials.

*Write for Bulletin No. 120-I*

ROTAMETERS *for every service* with emphasis on SERVICE

BROOKS ROTAMETER COMPANY Lansdale, Pennsylvania

When inquiring check CP 5973 on handy form, pgs. 2-3


**Scintillation counter**

(*Continued from page 59*)

4 — standard gamma head with variable size crystals
5 — standard beta head, either anthracene or plastic.

Fact that same photoelectric-electronic pick up system is retained when "head" change is made is important in providing equivalent conditions for comparing relative intensity.

Basic unit consists of RCA's 5819 photomultiplier, mu-metal magnetic shield, and dropping resistors. Phototube socket is spring mounted to insure snug seating against crystal mounting regardless of tube-to-tube size variations.

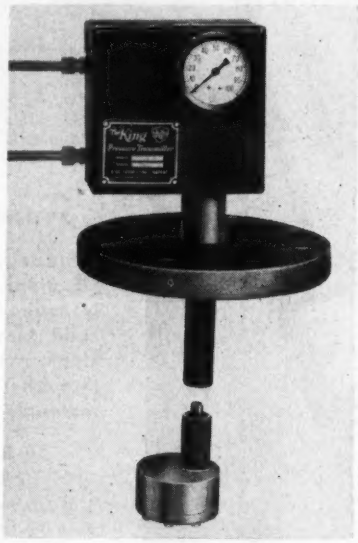
More attachments for this basic unit are forthcoming. Liquid sample heads, separate alpha caps, and fast neutron heads are among accessories soon to be announced.

(Radimax Universal Counter is a product of Nuclear Research and Development, Inc., Dept. CP, 1094 Sutter Ave., St. Louis 5, Mo. . . . or for more information check CP 5974 on handy form, pages 2 and 3.)

***Measures pressure or level of fluids with minimum of working parts . . .***

pressure pick-up is sealed off from system by a diaphragm, can be used with gases, practically any liquid

**Uses:** Can be used to measure pressure of gases and almost any liquid, including acids, akalis, solvents, hot tar, others. Can also be used for determining the level of these liquids in tanks or pressure vessels.



Only moving part in pressure transmitter is diaphragm, located in component at base of column

**Features:** Only moving part of transmitter is a stainless steel diaphragm. Accuracy is plus or minus 1/4" of water on vented tanks; plus or minus 1/2 to 1" of water on pressurized tanks.

**Description:** Pneumatic pressure transmitter can be used with pneumatic instruments for simple hydrostatic gages. Heart of the unit is a diaphragm which is exposed to the fluid to be measured. Pressure of the fluid on the outer side of diaphragm is balanced by pressure of air supply to the inner side. This balance is achieved because vent is closed when diaphragm is closed by liquid; is opened when over pressure of air forces diaphragm forward into liquid.

Linear output of the transmitter can be used with one or many receivers. These may be located at site of


SPECIAL JERGUSON WELDING PAD GAGES *are integral part of this tank*




*Welding Pad Gages staggered on tank for continuous visibility.*

HERE is a special line of gages that weld right to the liquid containing structure, thus becoming an integral part of it. It solves problems where it is impractical for you to use a conventional type gage because of solids in suspension in a liquid, etc.

These Special Gages follow Jerguson Standard Gages in general design and materials, except for the method of attaching. The chamber of the gage consists of a bar steel pad which is welded to the vessel.

Welding Pad Gages are made in both Reflex and Transparent types . . . in all sizes of Jerguson Standard Gages. Pressure ratings are available to your specific requirements. Welding pad may be of any metal desired to withstand corrosive or other conditions.

*Write for Data Unit on Welding Pad Gages for complete details. Whatever your gage problems, let Jerguson engineers assist you.*

JERGUSON

*Gages and Valves for the Observation of Liquids and Levels*

JERGUSON GAGE & VALVE COMPANY
100 Fellsway, Somerville 45, Mass.
Representatives in Major Cities
Phone Listed Under JERGUSON
Jerguson Tross Gage & Valve Co. Ltd., London, Eng.

When inquiring check CP 5975 on handy form, pgs. 2-3

measurement or remotely, subject to the usual restrictions on pneumatic instrument lines.

Transmitting unit is available for flange mounting, with the diaphragm inside the tank, or with a union connection so that fluid is brought outside the tank to the transmitter for measurement. Both types can be furnished for mounting at top, bottom, or side of tank. Combined liquid-pressure and equalizer unit is available for measuring liquid depth in pressurized tanks.

Usual pressure range is 0 to 45 psi. Special high-pressure units can be provided. Standard unit will tolerate over pressures to 250 psi. Sole power required is clean, dry instrument air at 70 psi or higher—unit consumes less than 4 cu ft per hr of free air. Diaphragm unit, including diaphragm itself, is 18-8 stainless. Remainder of transmitting unit is usually of steel and cast iron, though special materials, of course, may be used. Of the several models available, nearly all are shipped assembled and ready for installation.

(Pressure Transmitter is a product of King Engineering Corp., Dept. CP, Ann Arbor, Mich. . . . or for more information check CP 5976 on handy form, pages 2 and 3.)

### *Applications for electric eyes in process industries*

Two-page bulletin describes wide range of application of electric-eye instruments to process industries. Bulletin, by means of problem and solution format, covers some typical installations that have been made for instant and accurate monitoring of process flows. Techniques used for either gases or liquids are described. Special instruments are discussed. Sample tanks and look boxes are illustrated in drawings.

Bul 522 is issued by Ess Instrument Co., Dept. CP, 96 S. Washington Ave., Bergenfield, N. J. When inquiring specify CP 5977 on handy form, pages 2 and 3.

### *Proportioning pumps feature total liquid displacement at every stroke . . .*

locking nut maintains stroke adjustment which may be made while pump is running

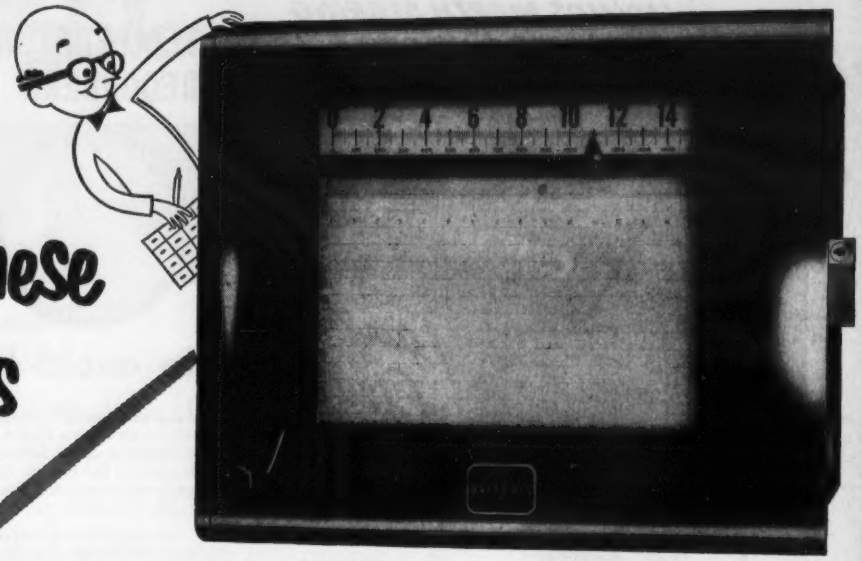
Chemical proportioning pumps which completely displace all liquid in the cylinder at every stroke have recently been announced. Length of stroke is adjustable even when pump is in full operation.

Unique stroke adjustment mechanism and legible indicating scale are stationary while pump is running. Piston arrangement eliminates return spring, since it is reciprocated by positive mechanical linkage to crank arm. Check valves are easily removed for cleaning or replacement.

Piston and cylinder assemblies of stainless steel (or other alloys) for 7500, 15,000, and 30,000 psi working pressures, are interchangeable in same pump frame.

Pumps are available in three styles: 1) simplex, 2) duplex — each side for same maximum working pressure, 3) combination duplex style — each side for different maximum working pressure. Units have various maximum displacements according to pressure.

(Pumps are products of American Instrument Co., Inc., Dept. CP, Silver Spring, Md. . . . or for more information check CP 5978 on handy form, pages 2 and 3.)

Check these features OF THE BRISTOL DYNAMASTER

—the electronic master-mind for your measuring, recording and controlling problems

✓ Continuous-balancing electronic circuit responds instantly to minute changes

✓ All types of electric and air-operated controllers offered

✓ Available as a self-balancing bridge or potentiometer

✓ Trouble-free operation

✓ Electronic component uses vacuum tubes available at any radio supply house

✓ Full-scale pen travel in 7, 3 or ⅔ seconds

✓ Chart speeds from ¾ in. per hour to 7200 in. per hour

✓ Multiple recorders up to 16 points

✓ Components interchangeable and easily replaced on all Dynamaster models

✓ Immune to most vibration or shock

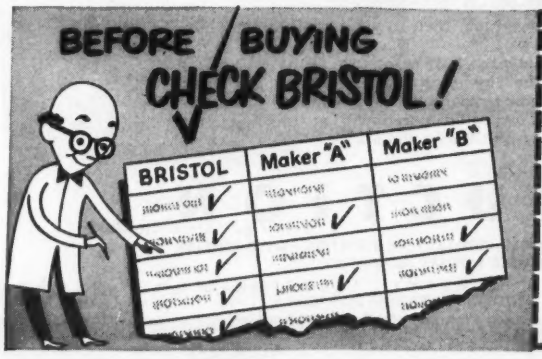
✓ Exceptionally unaffected by stray currents (1000 to 1 discrimination).

BRISTOL

FOR DETAILED PROOF of the sensitivity, versatility and reliability of the electronic Dynamaster, use the coupon or write for Catalog P1245.

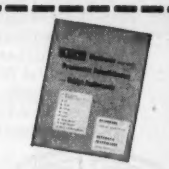
The dependable Guidepost of Industry

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS




THE BRISTOL COMPANY
141 Bristol Road
Waterbury 20, Conn.

Please send catalog giving details of Dynamaster performance to:



NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

When inquiring check CP 5979 on handy form, pgs. 2-3

"LIQUIDS WORTH STORING ARE WORTH MEASURING" with a



LIQUIDOMETER Tank Gauge

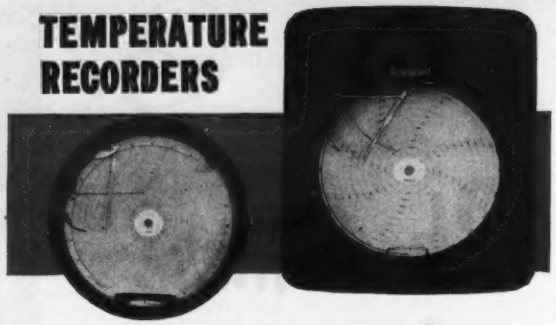
- FOR GAUGING LIQUIDS OF ALL KINDS
- 100% AUTOMATIC
- APPROVED BY UNDERWRITERS' LABORATORIES

WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP.
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 5980 on handy form, pgs. 2-3

TEMPERATURE RECORDERS



to avoid lost profits

**Accurate Foxboro Temperature Recorders** give you a minute-by-minute report of process conditions — an invaluable aid in determining future operation. Moreover, the records forecast impending difficulties — permitting corrections to be made before costly trouble starts.

Available with vapor pressure, gas pressure, or liquid expansion type systems. Choice of 50 standard bulbs; 700 chart ranges and scales from —450° to +1000°F. Round or rectangular cases for all operating conditions. Exclusive Foxboro design and construction advantages detailed in Bulletin 447. (Temperature indicators and controllers also available.) Write **The Foxboro Company, 8111 Norfolk St., Foxboro, Mass.**

FOXBORO TEMPERATURE RECORDERS

When inquiring check CP 5982 on handy form, pgs. 2-3

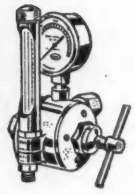
Regulate gases under pressure with Airco Accuracy!



**AIRCO REGULATORS** maintain precise gas flows and permit pressure determination with hairline accuracy. For every type of operation involving compressed gases! Model 8461 (illustrated) — a dual-stage metering regulator which indicates actual flow — has seen wide service in laboratory analysis and industrial processing.

In addition to this unit, there's an Airco model for dual or single stage . . . high or low pressure regulation in cylinders or through manifolds and pipe lines. For oxygen, nitrogen, acetylene, helium, argon, hydrogen, natural gas and propane.

What's the best regulator for the job? You'll find the answer in the Airco Catalog 5 which tells how to maintain desired uniform pressures . . . for a specific operation . . . at the lowest cost. A copy is yours for the asking.



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REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED

*at the frontiers of progress you'll find*

When inquiring check CP 5981 on handy form, pgs. 2-3



***Alarm systems use continuous sampling of gas-air mixtures to prevent explosions . . .***

units are arranged to give audible and visual signals when gas concentration reaches dangerous limits

**Uses:** Systems are designed to protect property and processes as well as life against explosive hazards of combustible gases and vapors in air. Typical applications include solvent evaporating ovens, solvent recovery systems, combustible gas storage areas, and tunnels containing gas lines.

**Features:** Systems provide continuous sampling of mixtures. Audible and visual signals indicate dangerous conditions. Operation of signals is automatic and adjustable.

**Description:** Davis Combustible Gas Alarm Systems utilize principle of catalytic combustion on heated platinum filament, having a high temperature coefficient of resistance. Sample containing combustible gas or vapor is passed over filament and burns on surface of filament. Temperature of filament is increased which in turn increases electrical resistance in proportion to amount of combustibles present.

Alarm systems use filaments in pairs — reference unit is mounted in sealed chamber while analyzing filament is mounted in separate chamber arranged for continuous passage of air-gas mixtures.

Output, or unbalance of circuit of Wheatstone Bridge formed with two chambers as two legs of bridge, is measured by meter calibrated directly in proportions of Lower Explosive Limit of gas or vapor.

Two types of systems are available. One unit is designed for continuous protection of one or several sampling locations. For this purpose an analyzing head is located in each remote area and analysis is transmitted back to main instrument panel. For protection of areas where continuous analysis at each point is not necessary alternative system provides for continuous "touring" of locations at pre-determined intervals.

All instruments may be furnished mounted on panels or cubicles. Flexibility of design allows incorporation of units in graphic panels and central control rooms.

Several accessories are available to equip systems for recording, additional alarms, and flow controls.

(Davis Continuous Combustible Gas Alarm Systems are products of Davis Instruments, Dept. CP, 47 Halleck St., Newark, N. J. . . . or for more information check CP 5983 on handy form, pages 2 and 3.)

***Reads smoke density in stack by Ringelmann number and per cent . . .***

continuous indication is supplemented by alarm in photoelectric instrument

**Uses:** Monitors plant smoke conditions and provides a simple check on over-all combustion efficiency.

**Features:** Continuous reading is provided both in Ringelmann numbers and per cent smoke density. Visual alarm warns when smoke conditions exceed pre-set limits.

**Description:** Indicators consist of three basic units: a light source, a photoelectric scanner, and a control-and-indicator. Light source and scanner are mounted on

opposite sides of stack. Indicator may be placed at any convenient location. Reduction in light transmitted due to smoke density is shown on a 4½" meter scale.

In addition to visual alarm (red and green pilot lights on indicator), a control relay may be set to close at any predetermined obscurity value between 10 and 100%. Relay is SPDT, handles 5 amp at 115 v AC.

Voltage regulator is recommended as auxiliary equipment in order to insure accurate readings. Further auxiliary equipment is available, including a complete line of smoke recorders and indicators.

Simplified mounting design and special shutter are easily installed. Power required is 115/230 v 60 cps AC.

(Series FE Fireye Photoelectric Smoke Indicator is a product of Combustion Control Corp., Department CP, 720 Beacon Street, Boston 15, Massachusetts . . . or for more information check CP 5984 on handy form, pages 2 and 3.)

### *Indicators show fluid flow and its direction*

Mechanical devices which indicate fluid flow and its direction by position of a flapper or ball, or by rotation of a wheel, are covered in 12-page bulletin.

Features of design, materials of construction, specifications, operation, and installation are outlined. Graphs illustrate performance curves for various units.

Bul 18W is issued by Schutte and Koerting Company, Dept. CP, Cornwells Heights, Bucks County, Pennsylvania. When inquiring specify CP 5985 on handy form, pages 2 and 3.

### *True motion balance relay provided in pneumatic controller . . .*

force balance method is not used in point-of-measurement instrument

True motion balance is employed in pneumatic controller. P-4 Pneumatrol unit does not use the force balance system commonly employed in point-of-measurement controllers. Instrument can be used for rate of flow, differential pressure, liquid level, viscosity, and temperature applications. Controller is usable for either single or dual instrument case mounting.

Lag is avoided by design of relay. Use of double diaphragm in relay permits back pressure on pilot nozzle to act over four times area of lower diaphragm on which output pressure of relay exerts balancing force. This assures low nozzle pressure and amplification of any variation of this pressure due to flapper position change.

Slack diaphragm construction provides floating top seat for relay valve, eliminating critical seat-to-seat dimension and consequent dead zone common in improperly adjusted relays. Maximum valve repositioning speed is assured by high capacity of relay.

Instrument is available in all modes of control, including on-off, narrow band proportional, and wide band proportional. Unit can be obtained with manual or automatic reset and with or without derivative action.

(Product of Fischer & Porter Co., Dept. CP, 6890 Jacksonville Road, Hatboro, Pa. . . . or for more information check CP 5986 on handy form, pages 2 and 3.)


# Dependable Control...




***The same unerring control*** that directs a pass into the waiting arms of a speeding end is a "built-in" advantage of every LESLIE Regulator. In automatic controls, as in sports, it's quality that makes the difference.

The fundamental principles of quality design, quality materials, quality manufacture, quality performance and quality service all combine to make LESLIE a logical choice for long-lasting, accurate, trouble-free pressure, temperature, or liquid level control.




Class L-3
Pressure Reducing Valve

TRADE LESLIE MARK

| | |
|---|---|
| PRESSURE REDUCING VALVES | —For Steam, Air or Gas. |
| PUMP GOVERNORS | —For pump discharge pressures. |
| DIAPHRAGM CONTROL VALVES | —For use with instrument controllers. |
| TEMPERATURE REGULATORS | —For process heating or cooling. |
| CONTROL PILOTS | —For pressure, temperature, and level control. |

SELF-CLEANING STRAINERS • AIR HORNS • STEAM WHISTLES

**LESLIE CO.** 281 Grant Avenue, Lyndhurst, New Jersey

*Write for illustrated bulletin on type of regulator desired.* 1788

QUALITY REGULATORS FOR OVER HALF A CENTURY

When inquiring check CP 5987 on handy form, pgs. 2-3

# BIDDLE *Instrument News*

**IF YOU MEASURE *SPEED***
**YOUR BEST BET IS *BIDDLE***

***If you want*—Readings of**

**AVERAGE RPM or FPM...**

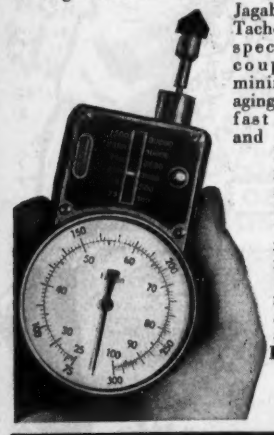


—choose one of the several ranges available in **Jagabi® Chronometric Speed Indicators** from 0-100 up to 0-100,000 rpm. The shaft or spindle is set in ball bearings. No lubrication needed. Design and construction of these instruments is such that a minimum of maintenance is required even in constant, severe service.

The **Jagabi Tachoscope,** stop watch and revolution counter, is also recommended for high accuracy work. **BULLETIN 35-PE.**

***If you want*—Readings of**
**INSTANTANEOUS SPEEDS or VARIATIONS in SPEEDS**

... select the **Jagabi® Centrifugal Tachometer**—speed ranges 25 to 48,000 rpm. Three—and five—ranges in one instrument . . . or the **Dr. Horn Tachometers** which are made with 6 ranges between 25 and 30,000 rpm. Both Jagabi and Dr. Horn Tachometers have a special friction coupling which minimizes the damaging effects of too fast acceleration and over-speeding. Results: Low maintenance and long, dependable service life, for direct indicating, rpm shaft or fpm linear and peripheral speeds and speed variations. **BULLETIN 35-CP.**



B-812



***If you want*— QUICK and ACCURATE RPM READINGS with *SAFETY***

... Consider the advantages of **Frahm® Resonant Reed Tachometers** for hand use or permanent mounting.

*No contact with moving parts is required.* Just touch the instrument to the chassis, frame or housing of the machine or motor and read the rpm directly. No moving parts. No lubrication or maintenance required. Accurate to ½ of 1%, they will operate continuously for years without any appreciable change. Instruments with limited ranges available for as little as $27. Practically any desired range within 900 and 100,000 rpm can be supplied. **BULLETIN 31-CP.**

**JAMES G. BIDDLE CO.**

**ELECTRICAL TESTING INSTRUMENTS**
•
**SPEED MEASURING INSTRUMENTS**
•
**LABORATORY & SCIENTIFIC EQUIPMENT**

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Gentlemen:
Please send me material checked:

☐ 35-CP ☐ 31-CP

NAME

JOB FUNCTION

COMPANY

ADDRESS

When inquiring check CP 5988 on handy form, pgs. 2-3

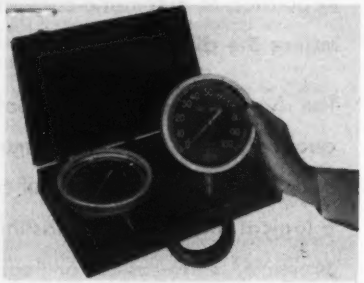



***Carry accurate gages to test location at 10,000 psi . . .***

portable set covers vacuum to high pressure with ½% accuracy

Portable test gages are 6 inches in diameter and designed to be easily carried to test locations. These instruments have a composite range from 0 to 30 inches mercury to 0 to 10,000 psi. Guaranteed accuracy is ½ of 1% of total scale at any point throughout instrument range.

Specially selected materials are used in the construction — cast aluminum



Steel or beryllium copper Bourdon tube

for case, steel or beryllium copper for Bourdon tube, chrome-plated steel for pinion, segment, and arbor, monel plates, and a stainless steel hairspring. Bourdon tube is a full 270°. Pointer is of stainless. Leather carrying case with shoulder strap can also be furnished.

(Model P Test Gage is a product of The Foxboro Company, Dept. CP, Foxboro, Mass. . . . or for more information check CP 5989 on handy form, pages 2 and 3.)

***All-electronic system for process control***

Electrical operation of control systems is possible through use of all-electronic instruments described in 6-page bulletin. Process variables—such as flow, temperature, pressure, and liquid level—may be controlled automatically.

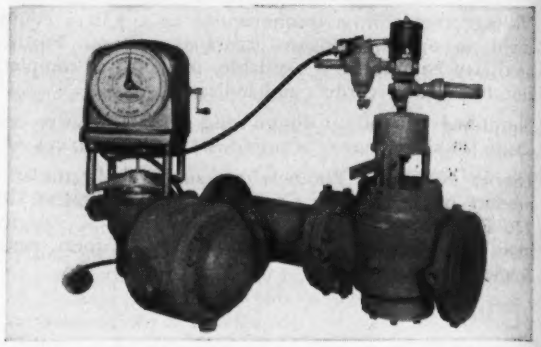
Brief resume of basic principle and detailed description of unit are given. Photographs, schematic diagram, and dimensional drawings illustrate and explain units. Features, design, set-point, operation, specifications, installation, adjustments, and maintenance are discussed.

Table outlines various available models and features. Bul A-702 is issued by The Swartwout Co., Dept. CP, 18511 Euclid Ave., Cleveland 12, Ohio. When inquiring specify CP 5990 on handy form, pages 2 & 3.


**When engineers think of**

# Automatic Batching

**they automatically think of**



THE *Fluidometer* SYSTEM

Bulletin F149 sent on request.

**HETHERINGTON & BERNER INC.**
*Engineers—Manufacturers*
711 Kentucky Ave. Indianapolis 7, Ind.

When inquiring check CP 5991 on handy form, pgs. 2-3

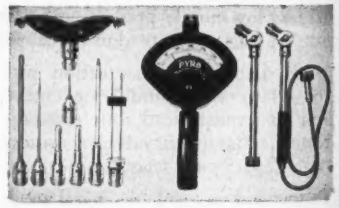
■ *Accurate Temperatures*
**AT A GLANCE WITH THE SIMPLIFIED PYRO OPTICAL PYROMETER**



Any operator can quickly determine temperatures on minute spots, fast-moving objects and smallest streams. Completely self-contained. No calibration charts or accessories needed. An accurate, direct reading Pyrometer that pays for itself by helping prevent spoilage. Weighs 3 lbs. Available in 5 temperature ranges (1400° F. to 7500° F.). Ask for *free* Catalog No. 85.

**The Improved PYRO SURFACE PYROMETER**

8 instruments in one, handles all surface and sub-surface temperature measuring jobs. Has selection of 8 types of thermocouples; all interchangeable in seconds with no recalibration or adjustment. Automatic cold end compensator. Shock, moisture and dust-proof. Accurate, big 4¾" indicator. Available in 5 temperature ranges. From 0-300 to 0-1200°F.



ASK FOR FREE CATALOG No. 168

**The Pyrometer Instrument Company**
New Plant and Laboratory BERGENFIELD 28, NEW JERSEY
Manufacturers of Pyro Optical, Radiation, Immersion and Surface Pyrometers for over 25 years

When inquiring check CP 5992 on handy form, pgs. 2-3

***20,000 psi or extreme temperatures do not stop flow meter's accurate operation . . .***

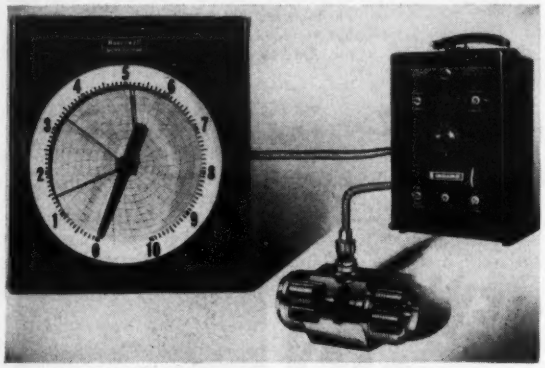
trickle flows and 4000 gpm are both within reach of rotating element with electronic pick-up

**Uses:** Meters and records flows from small rate to 4000 gallons per minute.

**Features:** Good accuracy is reported even when element is used at high pressures (up to 20,000 psi), with viscous fluids, or at temperatures from −269 to 1200°F.

**Description:** Flowmeter consists of three principal parts: sensing element which, when installed in flowing liquid, produces AC whose frequency is directly proportional to flow; a converter producing DC with voltage proportional to AC frequency from sensing element; and an electronic potentiometer which indicates and records flow.

First designed for aircraft use, sensing element uses Venturi principle with a small rotor floating in its throat. This rotor spins at a rate proportional to



Sensing element is easy to clean, easy to maintain

velocity through the unit. Since rotor contains a permanent magnet, a small pick-up coil on outside of sensing element housing gets an AC signal proportional to spin, thus to velocity.

AC signal is put through converter and resultant DC signal operates standard round- or strip-chart recorder, integrator, or precision indicator. These may be calibrated to read volume rate or (when specific gravity correction is made) weight rate.

Sensing element is particularly good for installations where grit, abrasives, and corrosives are handled. Requiring practically no maintenance, unit will operate for long periods without signs of wear. Abrasives have no effect on operation and reduce life only slightly. Only restriction on suspended material is that size must be small enough to pass through vanes easily without blocking openings. Sensing element is easily removed from line and dismantled for cleaning. Cleaning in the line with chemicals is also practical, and metered liquid will often keep element permanently cleaned.

Standard materials are aluminum and stainless with housing, guides, etc, of ethylene fluoride type plastic.

(Potter-Brown Flowmeter is available through Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. . . . or for more information check CP 5993 on handy form, pages 2 and 3.)

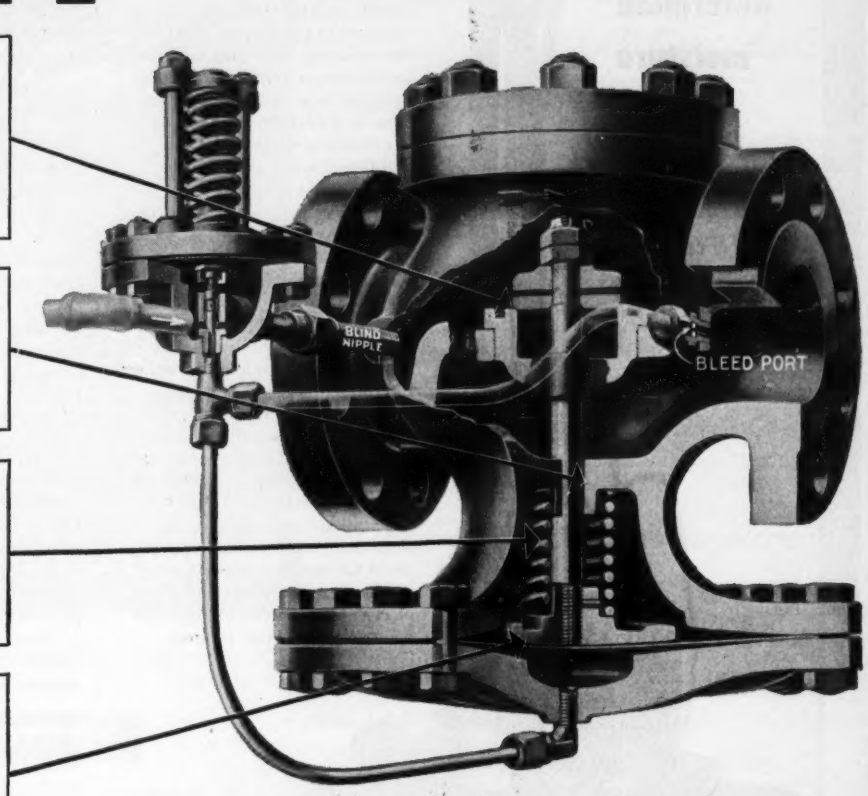

# WHY Spence Regulators Outlast The Field

**SECO METAL SEATS AND DISCS — Durable SECO Metal resists wiredrawing. More than *twenty years of experience* in thousands of installations has failed to produce a single case where SECO Metal has been cut by steam.**

**PACKLESS CONSTRUCTION — All Spence main valves and most pilots are built without stuffing boxes. This minimizes friction . . . eliminates much time-consuming maintenance.**

**SPRING OUT OF PATH OF STEAM — The spring in the Spence Regulator is out of the path of the steam or other fluid flowing through the valve. It operates at low unit stress for exceptionally long life.**

**LARGE BALANCED DIAPHRAGM—Spence metal diaphragms, under usual conditions, never require replacement. Spence Regulators have few moving parts and those few are ruggedly constructed and seldom require attention.**




**Spence Type EQ back pressure regulator-operation of main valve is controlled by a sensitive pilot to regulate the initial pressure. Same pilot is used with all sizes of main valves.**

The features shown above explain why you profit on every important count with Spence Pressure and Temperature Regulators.

Learn more about these and many other advantages of Spence Regulators by sending for Bulletin 350.

**DURABILITY** — Spence Regulators perform dependably year after year.

**ACCURACY** — You can be sure of accurate control for the life of the regulator.

**MAINTENANCE** — You don't need expensive repairs or special maintenance. That means less down-time, less time and money wasted on replacement of parts.

SE-110

SPENCE ENGINEERING COMPANY, INC.
WALDEN, NEW YORK

Spence

When inquiring check CP 5994 on handy form, pgs. 2-3

**NOW**

**...you can determine moisture content**

*rapidly, accurately, automatically!*

**THE BECKMAN AQUAMETER**



The Beckman Aquameter brings added speed and accuracy to routine moisture analyses of such products as pharmaceuticals, alcohols, ethers, solvents, antibiotics, food products and a host of other materials sold on a moisture-free basis. It is also extensively used in processing operations where moisture is a key indication.

Other techniques now used for determining moisture (oven-drying, distillation, etc.) are tediously time-consuming and necessitate complex expensive equipment. Manual titrations require the skill of highly trained technicians experienced in interpreting and identifying gradual color variations. But the simple, fully automatic operation of the Beckman Aquameter reduces titration time to an average of only one or two minutes, and most titrations can be reproduced to within ±0.05 ml.

Titrations performed on the Aquameter are reproducible to 0.05 ml of KF Reagent, which corresponds to a few tenths milligram of $H_2O$—a sensitivity unsurpassed by any other routine method.

**The Beckman Aquameter** applies a new principle to the "dead stop" technique, recognized as the most sensitive of the instrumental methods for Karl Fischer titrations, and recommended by the U. S. Pharmacopoeia. Initial adjustment is simple and easily made, and any number of sequential titrations can be carried out with no further checking or setting, simply by adding the sample and pushing a button. The titration is completed automatically and without attention.

**For full details write for Data File #41-11**

BECKMAN INSTRUMENTS control modern industries

**BECKMAN INSTRUMENTS, INC.**

SOUTH PASADENA, CALIFORNIA

Factory Service Branches: New York—Chicago—Los Angeles

BECKMAN INSTRUMENTS include: pH Meters and Electrodes • Spectrophotometers • Radioactivity Meters • Special Instruments

When inquiring check CP 5995 on handy form, pgs. 2-3


***Phototube either inside or outside of rugged control unit . . .***

separate phototube unit is small enough for cramped spaces

**Uses:** Counting, conveyor control, inspection, safety systems on moving machinery. Photoelectric control unit can be used in many specialized applications too.

**Features:** Phototube itself can be mounted in a small separate housing, or built in the control unit proper.

**Description:** Phototube of this control unit must be located at the point of observation. Where ample space is available, phototube is housed in the control unit proper. Crowded conditions may call for use of a small, separate phototube housing. Light source requires only low voltage which is supplied at a terminal board in the control unit. Up to twenty feet may be allowed between the light source and phototube.

Control unit will withstand high temperature, humidity, and vibration. Designed for high speed operation, unit provides control action in 1/20th of a second. Sensitivity may be adjusted to cause control action at any predetermined light level from 10 to 50 foot candles. Relay is a DPST to handle 20 amp at 115 v AC, or 10 amp at 230 v AC.

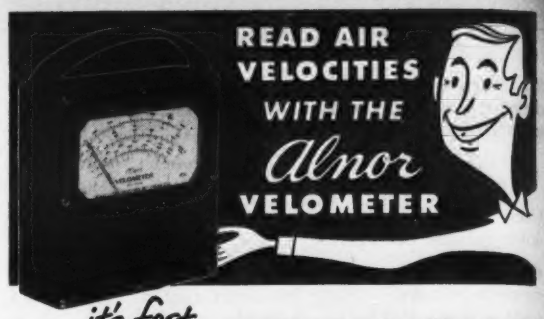
(Series 20 and 21 Photoelectric Controllers are products of Photoswitch Inc., Dept. CP, 77 Broadway, Cambridge 42, Mass. . . . or for more information check CP 5996 on handy form, pages 2 and 3.)

***Portable device to test presence of explosive vapors . . .***

powered by flashlight batteries

MSA Explosimeter Model 2 is portable instrument approved by UL for detecting hazardous gas or vapor-air atmospheres. It has filter cartridge, incorporating chemical reagent, to sample leaded gasoline. Light, compact instrument is powered by flashlight batteries. Sampling line of synthetic rubber is included for use in remote sampling of atmospheres which may be explosive.

(Product of Mine Safety Appliances Company, Dept. CP, Braddock, Thomas, and Meade Sts., Pittsburgh 8, Pa. . . . or for more information check CP 5997 on handy form, pages 2 and 3.)


*it's fast* . . . you get instant, precise readings directly from scale face . . . no need for reference charts or calculations. Measure air flow through ducts, grilles, motors, spray booths, etc., or in the open.

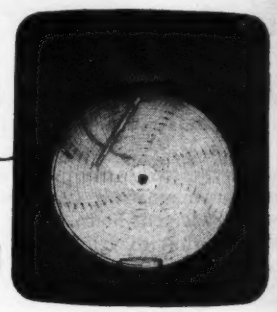
*it's accurate* . . . brings laboratory standards of air velocity measurement to the production line, mine, mill . . . anywhere. Needs no special care or handling . . . anyone can use it and get accurate results.

*it's portable* . . . completely self-contained, hand-held. Rugged construction and sturdy case protect the Velometer from usual hazards of portable use. Available in scale ranges to 24,000 f.p.m. Wide selection of jets and fittings assures adaptability of Alnor Velometer to your application. Get full details and prices, write for Bulletin 2448-G. Illinois Testing Laboratories, Inc., Rm. 504, 420 N. La Salle St., Chicago 10, Ill.

Alnor PRECISION INSTRUMENTS FOR EVERY INDUSTRY

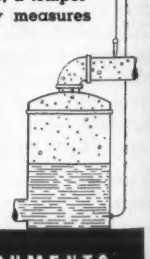
When inquiring check CP 5998 on handy form, pgs. 2-3

**NEW ACCURACY for CONCENTRATION MEASUREMENT**



New opportunities for higher accuracy in liquid concentration control are now offered by Foxboro Temperature Difference Measurement. This modern method of measurement takes full advantage of Foxboro Dynalog Electronic Instruments . . . unequalled for their sensitivity, speed and accuracy. By continuous comparison of boiling point of product with that of water at the same pressure, a temperature difference Dynalog Recorder accurately measures *boiling point rise.*

Important new possibilities are opened up by this precise method of measuring temperature differences. Consider where it might help you. Write for details. The Foxboro Co., 8111 Neponset Ave., Foxboro, Mass., U.S.A.



FOXBORO

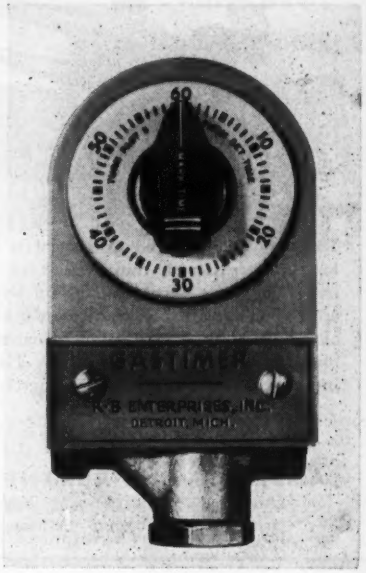
Reg. U.S. Pat. Off.

DYNALOG ELECTRONIC INSTRUMENTS

When inquiring check CP 5999 on handy form, pgs. 2-3

***No electrical hook-up needed for automatically cutting gas supply . . .***

precision timer cuts gas after periods to one hour and sounds a warning bell




**Uses:** Automatically shuts off gas flow after any predetermined period up to one hour. Can be conveniently used on water heaters, hot plates, room heaters, similar small applications where gas line is not much larger than ½".

**Features:** Timing mechanism is completely mechanical, requires no electric power or hook-up.

**Description:** Gastimer is a self-contained unit comprising timer and gas shut-off valve. It can be installed and operated in any position. Made of brass, valve has ½" female inlet and outlet. Capacity is close to 50,000 Btu per hour of 1000 Btu per cu ft gas with a pressure drop of 0.5 inch water.

Timer mechanism may be removed without removing valve or cutting off the gas. When uninterrupted flow is required, manual hold-open feature may be used.

This timer mechanism also contains a warning bell which sounds when gas has been cut. Pilot take-off is optional equipment.

(Gastimer is a development of R. B. Enterprises, Inc., Dept. CP, 2832 E. Grand Blvd., Detroit 11, Mich. . . . or for more information check CP 6000 on handy form, pages 2 and 3.)

***Temperature indicators cover range from 113 to 1950°F***

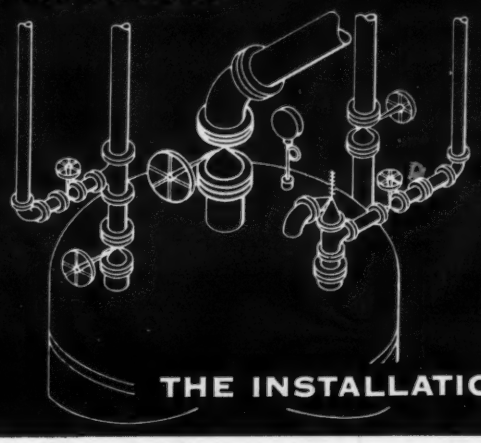
Two-page instruction sheet gives directions for use of 60 different temperature-sensitive liquids covering range from 113 to 1950°F. Each solution consists of materials of calibrated melting points suspended in inert, volatile, nonflammable vehicle. Each solution indicates a specific temperature, with a tolerance of plus or minus 1% of its rating.

Detailed directions are given for applying liquid to various types of surfaces and objects. Number of special techniques are discussed. Suggestions for determination of temperature distribution, isothermal boundaries, heat conduction, and other data are given.

Instruction sheet 5010L is issued by Tempil® Corporation, Department CP, 11 West 25th Street, New York 10, New York. When inquiring specify CP 6001 on handy form, pages 2 and 3.


# Are You Getting this Low-Cost Alloy Valve Service?

...on Starch Converters, for instance



THE INSTALLATION

Crane Ni-Resist valves on starch inlet lines to converters, Corn Products Refining Co. plant, Argo, Ill.

**VALVE SERVICE RATINGS**

**CORROSION-RESISTANCE:** Ni-Resist OK—18-8 Mo trim ideal

**SUITABILITY:** Good for this mildly corrosive service

**MAINTENANCE COST:** None—except routine stuffing box

**SERVICE LIFE:** 5 times longer to-date than other valves

**OPERATING RESULTS:** Much less process interruption

**PRICE:** On line

**AVAILABILITY:** Regular Crane Catalog item

**THE HISTORY**

Valves in this service are constantly exposed to hydrochloric acid vapors under working pressure of 50 psi at approximately 280 deg. F. None of the valves formerly used lasted more than 2 to 3 weeks without repairs. In 3 to 4 months they had to be retired from service for rebuilding. Maintenance costs were excessively high.

To stop the trouble, the plant chose Crane Ni-Resist Alloy Cast Iron Gate Valves with Crane 18-8 Mo trim. Since being installed, these valves have operated at highest efficiency. On last inspection after 19 months' uninterrupted service, they were still in excellent condition.

**THE VALVE**

Crane Ni-Resist Cast Iron Gate Valves combine, at moderate cost, the physical properties of quality cast iron with substantially greater resistance to corrosion, erosion, and wear. With 18-8 Mo Alloy trim, they step up valve efficiency on many chemical process services where common cast iron is inadequate. For recommendations, see your Crane Catalog, or call your Crane Representative.




***The Complete Crane Line Meets All Valve Needs. That's Why***

**More Crane Valves Are Used Than Any Other Make!**

# CRANE VALVES

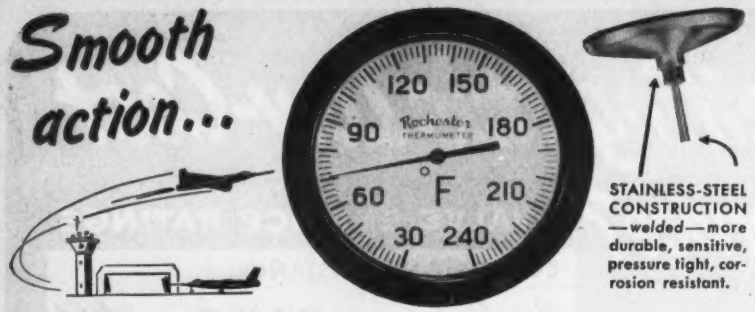
CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois

*Branches and Wholesalers Serving All Industrial Areas*

**VALVES • FITTINGS • PIPE • PLUMBING • HEATING**

When inquiring check CP 6002 on handy form, pgs. 2-3

Smooth action...




**Rochester DIAL THERMOMETERS**

**react instantly to temperature changes!**

• The superior dampening in ROCHESTER Dial Thermometers will never *"set-up"* or *"freeze"* the pointer in one position. It assures fast, smooth action at all times. New bimetallic elements never *"tire"* or lose their accuracy . . . take violent temperature change without error in indication.

Made of *corrosion resistant* stainless steel . . . backed by 35 years of instrument-making experience . . . ROCHESTER Dial Thermometers are ideal for heavy-duty service. *And they're made to meet U. S. Air Force specifications.*

Order them today from your Rochester Representative or write for further details. Rochester Manufacturing Co., Inc., 86 Rockwood St., Rochester 10, N. Y.

**Rochester** Manufacturing Company, Inc.
86 Rockwood St., Rochester 10, N. Y.
DIAL THERMOMETERS GAUGES AMMETERS
ROCHESTER DEPENDABLE ACCURACY GAUGES

When inquiring check CP 6003 on handy form, pgs. 2-3





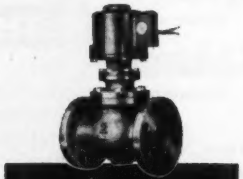

Take it easy, brother. Don't yell. There's no need to shout or even do anything to stop the flow in fuel and process lines when they are protected by

**ASCO Safety Shut-off Valves**

***(Factory Mutuals Approved)***

Perhaps you have an oil or gas burner operating in a rather hazardous location and want an automatic cut off . . . or your process lines are carrying fluids (liquid or gas) which if allowed to flow after trouble has developed could cause an explosion . . . or you are operating vital and expensive equipment which should not continue running if, for example, the lubricating system failed . . . these are the spots for "Factory Mutuals Approved" ASCO SAFETY SHUT-OFF VALVES. *They stop the flow instantly and automatically.*

Don't leave the shutting down of lines to the alertness of operators. On every line, use the automatic—sure—electrically operated valves. We have a complete line of such solenoid valves from which to select. Write us in detail concerning your requirements.


Bulletin 8010—packless, used with push button reset relay for remote manual resetting. Factory Mutual approved


Bulletin 8020—free handle manual reset safety shut-off valve for air and non-corrosive gas. Factory Mutual approved

ASCO Solenoid VALVES

We also manufacture a quality line of Automatic Transfer Switches, Remote Control Switches, Contactors and Relays

**Automatic Switch Co.**

379 LAKESIDE AVENUE • ORANGE, N. J.

V-25-5

When inquiring check CP 6004 on handy form, pgs. 2-3


## INSTRUMENTATION

***Three thermocouple wires handle nearly all temperatures***

Three recently developed thermocouple lead wires have a composition range from below zero to 2000°F.

Low-temperature wire is insulated with plasticized vinyl chloride, tolerates temperatures from –20 to 225°F. Non-impregnated glass insulation is used to insulate wire for the middle range of room temperature to 1200°F. For still higher reaches, insulation is fibrous silica — it takes 2000°F.

(Announced by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. . . . or for more information check CP 6005 on handy form, pages 2 and 3.)

***Lists over 200 types of thermometers***

Tables and photographs outline specifications and features of over 200 types of thermometers. Four-page catalog includes information for precision, titer test, weathering test, calorimetric, Beckman, midget, ground joint, low temperature, armored, and other thermometers.

Cat A-52 is issued by Brooklyn Thermometer Co., Dept. CP, 217-09 Merrick Blvd., Springfield Gardens, N. Y. When inquiring specify CP 6006 on handy form, pages 2 and 3.

***Floats sink in liquid but give accurate level control . . .***

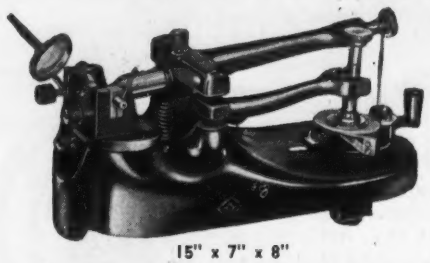
made of procelain, they submerge but produce control action

Important difference between conventional float liquid level controls and Model A-100 is that displacers or "floats" are made of solid block porcelain. Two of these displacers mounted on a stem can control switch contacts in accordance with liquid level. Because the displacers sink into the liquid whose level is being measured, effects of surging and swirling are minimized. Control action takes place consistently at the same liquid level.

Porcelain displacers are immune to corrosion by nearly all industrial liquids. Control point can be changed at any time by raising or lowering either (or both) displacers. Control unit mounts by means of 1¼-inch NPT threaded fitting. A flange mounting model is also available. Both high and low levels can be used to actuate switch


**CAMBRIDGE ROCKING MICROTOME**

CUTS SECTIONS DOWN TO 1/5 MICRON



15" x 7" x 8"

This moderately priced instrument is designed specially for cutting extremely thin sections for use with the Electron Microscope. The sections cut with this Microtome are ribboned, which makes it most convenient for studies of sections serially. Will accommodate Gillette razor blade or special Microtome knife. Fitted with magnifying lens for observing work in progress.

*Write for Bulletin L 293.*

**CAMBRIDGE INSTRUMENT CO., INC.**
3706 Grand Central Terminal, New York 17, N. Y.
PIONEER MANUFACTURER OF PRECISION INSTRUMENTS

When inquirnig check CP 6007 on handy form, pgs. 2-3



BUILDERS

**BUILDERS-PROVIDENCE**

NEED RECORDING, INDICATING, CONTROLLING INSTRUMENTS ?

For full information on BUILDERS EQUIPMENT for metering and controlling flow of liquids, steam, or dry materials, write Builders-Providence, Inc. (Division of Builders Iron Foundry), 458 Harris Ave., Providence 1, Rhode Island.

**BUILDERS-PROVIDENCE**

*See us in Booth 93 at the Power Show*

When inquiring check CP 6008 on handy form, pgs. 2-3

THERE'S *Safety* IN THESE NUMBERS



Stop Losses
Control Costs
Guard Formulas

ROCKWELL INDUSTRIAL METERS

Let Rockwell industrial meters "police" for your accountants and production supervisors every liquid movement within your plant. You can install these lastingly accurate guardians with profit when batch mixing formulas, for inventory records, for cost identification. A size and type meter for every need. Measure practically every liquid. Write for bulletin.

**ROCKWELL MANUFACTURING COMPANY**
**Dept. A6, 400 N. Lexington Ave., Pittsburgh 8, Pa.**

When inquiring check CP 6009 on handy form, pgs. 2-3



For MODERN
*Chemical Analysis*
*Product Grading*
*Process Control*

. . . Use the New HELLIGE
**Chromatron**
PHOTOELECTRIC COLORIMETER and TURBIDIMETER



Easy 3-step Operation
Instantaneous Results
Unlimited Application
Completely Portable
Always Dependable

*Write Today!*

*Please Send FREE Catalog No. 925*
NAME
STREET
CITY STATE
HELLIGE, Inc. 877 STEWART AVENUE GARDEN CITY, N. Y.

When inquiring check CP 6010 on handy form, pgs. 2-3


if three displacers are used on the same stem. Standard units are available for level differentials from 4 inches to 12 feet. Greater level changes (up to 100 feet) can be controlled with similar units employing a flexible stainless wire in place of the stem.

A wide variety of switches and switch housings are available to meet splash-proof, explosion-proof, moisture-proof, and completely submersible requirements.

(Model A-100 Liquid Level Controller is manufactured by Magnetrol, Inc., Dept. CP, 2110 S. Marshall St., Chicago, Ill. . . . or for more information check CP 6011 on handy form, pages 2 and 3.)

***Pumps small quantities of corrosives at rates to 60 gal/day . . .***

only plastic or rubber parts touch liquid being pumped

**Uses:** Small pump can handle up to 60 gallons a day of corrosive materials like alum, caustic soda, hydrochloric, sodium hypochlorite, sodium fluoride, soda ash, and sulfuric acid.

**Features:** Simple and compact, pump has all surfaces in contact with solution made of chemically resistant synthetic rubber or plastic.

**Description:** Chlorinating pump is a positive displacement diaphragm type. Power is supplied by a shaded pole motor through a gear reduction train which is immersed in oil. Eccentric cam drives the diaphragm at 36 strokes per minute. Capacity is adjustable (while running) from 5 to 60 gallons per 24 hours.

Pump is available as a simplex or duplex model. Pump heads are individually adjustable while running, contain only seven major parts, can be easily disassembled and assembled. Though fitted with plastic tubing for coupling with a ¼" pipe fitting, pump is rated at 125 psi. Anti-syphon valve can be provided where solutions are going to be injected into suction lines.

Pump measures only 9½ x 8½ x 6½ inches high. Motor draws 1.3 amp (90 watt) from standard 115 v AC line.

(Model S Chemical Solution Feed Pump is a development of Precision Machine Co., Dept. CP, 5 Union Square, Somerville 43, Mass. . . . or for more information check CP 6012 on handy form, pages 2 and 3.)


COMPACT
ACCURATE
LIGHT WEIGHT
DEPENDABLE



SERIES 300

**wheelco**
PORTABLE POTENTIOMETER

Designed for precise checking and calibrating of temperature measurement and control instruments, the Wheelco Portable Potentiometer is a versatile instrument.

• Entirely self-contained, it requires no external accessories. A special compartment accommodates dry cells for supplying current to the potentiometric circuit.

• Accurate to .025 millivolts, sturdily constructed for long laboratory or field service, convenient in size, weight and portability — the Wheelco Potentiometer is RIGHT for your requirements.

FOR A COMPLETE DISCUSSION OF FEATURES AND SPECIFICATIONS SEND FOR BULLETIN A502



FOR LABORATORY, PLANT AND FIELD SERVICE WORK

- ACCURATE TO .025 MILLIVOLTS
- COMPLETELY SELF-CONTAINED
- STURDY ALUMINUM FRAME

BARBER COLMAN
Instrumentality

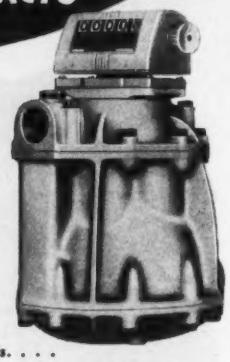
**wheelco instruments division**
BARBER-COLMAN COMPANY
1258 ROCK STREET • ROCKFORD, ILLINOIS

When inquiring check CP 6013 on handy form, pgs. 2-3

YOU NAME THE LIQUID . . .

BOWSER

WILL MEASURE IT WITH XACTO



. . . "the meter that changed chemical processing habits"!

For over a quarter century Bowser Xacto meters have brought to the chemical industry an entirely new way to measure liquids accurately and dependably.

Wherever accurate measurement is essential to assure uniformity of product and control costs . . . there you will usually find Bowser Xacto meters on the job.

*Today XACTO meters are handling these and 638 other liquids. . . .*

| | | | |
|---|---|---|---|
| Acetic Anhydride | Amyl Acetate | Carbolic Acid | Iso-Propyl Acetate |
| Alum Solution | Anhydrous Ammonia | Cellosolve Acetate | Lactic Acid |
| Ammonium Chloride | Aqueous Ammonia | Copper Nitrate | Napthenic Acid |
| Ammonium Nitrate | Arsenic Acid | Copper Sulphate | Resin Alkyd |
| Ammonium Phosphate | Butyl Acetate | Cresol | Stearic Acid |
| Ammonium Sulphate | Calcium Bisulphite | Cresylic Acid | Tannic Acid |

MAY WE SEND COMPLETE DATA?

BOWSER, INC., 1315 Creighton Avenue, Fort Wayne 2, Ind.

Regional Offices • Atlanta • Chicago • Cleveland • Dallas • Kansas City • New York • San Francisco • Washington, D. C. • Hamilton, Ont.

When inquiring check CP 6014 on handy form, pgs. 2-3

made right to work right

BENDIX-FRIEZ

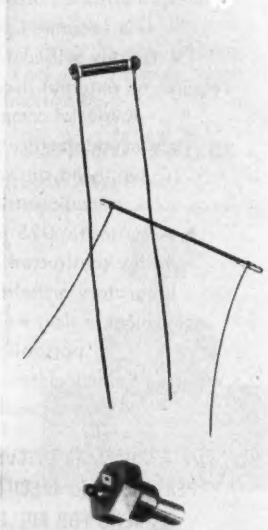
high-precision thermistors

Whether you use these temperature responsive resistors in standard or special models, you can be sure of this. *They'll match your needs* for resistance values, size, temperature coefficient, mountings and quality. Made in our own plant under carefully controlled conditions, Bendix-Friez Thermistors know no equal.

STANDARD TYPES FOR IMMEDIATE DELIVERY

| Size (inches) | @ +30°C. | @ 0°C. | @ −30°C. |
|---|---|---|---|
| .140 x .75 | 45.0 ohms | 86 ohms | 194 ohms |
| .040 x 1.5 | 12,250 ohms | 26,200 ohms | 65,340 ohms |
| .018 x 1.5 | 35,000 ohms | 82,290 ohms | 229,600 ohms |

*Write for details.*



Used in this typical application for sensing the temperature of hydraulic oil.

FRIEZ INSTRUMENT DIVISION of . .

1450 Taylor Avenue, BALTIMORE 4, MARYLAND

Export Sales: Bendix International Division 72 Fifth Avenue, New York 11, N. Y.

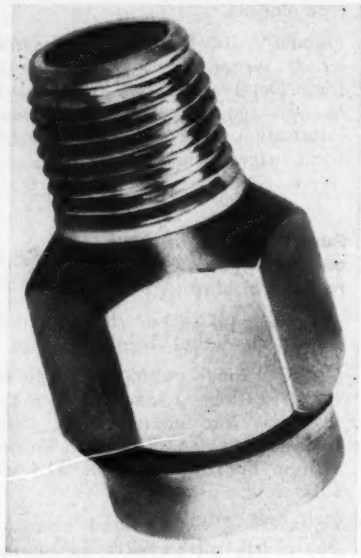
Bendix AVIATION CORPORATION

When inquiring check CP 6015 on handy form, pgs. 2-3

***"Double feature snubber" stops pulsations, moisture, too . . .***

porous plug type now incorporates water repellency

Primary purpose of these pressure snubbers is still to damp pulsations of pressure to prevent damage to pressure gages. Treating the porous stainless steel filter discs with a silicone, however, will further prolong pressure



gage life by keeping water out of the gage. Keeping gages dry also reduces errors by preventing corrosion of the Bourdon tube.

Droplets of water or oil in the gas are prevented from entering the pressure gage because droplets collect on the non-wetting surface of the porous plug, coalesce, and drain off. Silicone treating entails no other major changes in the snubber.

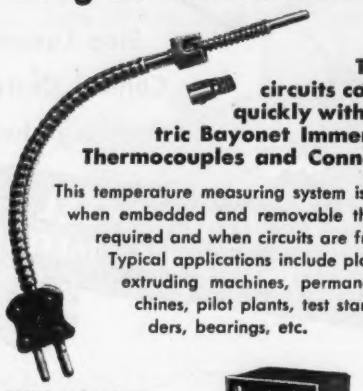
(Development of Micro Metallic Corporation, Dept. CP, 30 Sea Cliff Ave., Glen Cove, N. Y. . . . or for more information check CP 6016 on handy form, pages 2 and 3.)

***Capsule description of X-ray analysis***

Three X-ray instruments available for non-destructive analysis are described in 8-page booklet. Diagrams are used to show principles of operation for units, data are given on fields of application, and list of users is included.

Photos illustrate components of three types of units. "Facts and Figures on Three Powerful X-ray Tools for Non-Destructive Analysis" is issued by Research and Control Instruments Div.,

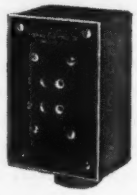
**Twist Cap of Thermocouple & Plug In Connector**



**Thermocouple circuits completed that quickly with Thermo Electric Bayonet Immersion Contact Thermocouples and Connector Panels.**

This temperature measuring system is principally used when embedded and removable thermocouples are required and when circuits are frequently broken. Typical applications include plastic molding and extruding machines, permanent molding machines, pilot plants, test stands, engine cylinders, bearings, etc.

Type 202D Iron Constantan Bayonet Immersion Contact Thermocouple has silver tip for rapid response, drill angle taper for proper seating, spring tension for good thermal contact.



Type JBW Connector Panel with FS Conduit Box for 1, 2, 3, 4, or 5 circuits.

*Write for Catalog R*

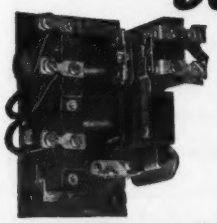
Thermo Electric Co., Inc.

FAIR LAWN NEW JERSEY

When inquiring check CP 6017 on handy form, pgs. 2-3




All Electric FLOATLESS LIQUID LEVEL CONTROLS



The original — pioneered by B/W in 1933. No floats! No vacuum tubes! No moving parts in liquid. Literature describes relays and switches, automatic starter and relay combinations, multiple pump controls, special controls and panels and many application diagrams.

Controls not affected by pressures, temperatures, acids or caustics. Remote control if desired. Ice free electrodes where necessary.

WRITE FOR CATALOG

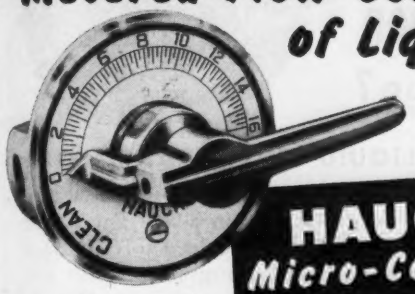
B/W CONTROLLER CORPORATION

2204 E. Maple Road, Birmingham, Mich.

FIRST IN THE FLOATLESS CONTROL FIELD

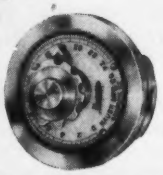
When inquiring check CP 6018 on handy form, pgs. 2-3

## Get Straight Line Metered Flow Control of Liquids



**HAUCK Micro-Control VALVES**

*Above—Self-clean metering type, lever or hand wheel type, 1/4" and 3/8" pipe size. Below—Micro-cam type, lever or hand wheel type, 1/4" to 1" pipe size.*



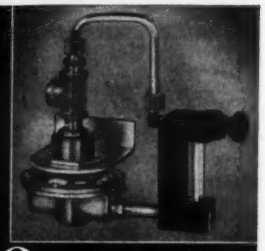
Stop "guesstimating." With Hauck Micro Valves you get visible, positive, speedy, accurate control from full opening to full shut-off. Discharge is directly proportional to setting on calibrated dial. Self-cleaning feature eliminates clogging. Can be operated manually or in automatic control system.

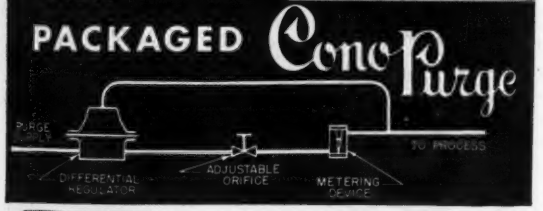
Thousands in use with oil burners, and in pipe lines and processing equipment for vegetable oils, syrups, water, chemicals, etc. Available in steel and corrosion-resistant construction.

**HAUCK MANUFACTURING CO.**
*Industrial Oil and Gas Burners and Equipment*
132-142 Tenth Street • Brooklyn 15, New York

When inquiring check CP 6019 on handy form, pgs. 2-3

CONSTANT Metered Purge Rate with PACKAGED Cono Purge






No supervision needed at installation; only two pipe connections required. By providing absolute control of differential pressure across an adjustable orifice, Cono Purge assures constant rate of flow regardless of variations in upstream or downstream pressures. Primarily for use as a purging system on flow metering service or on bubble type level gauges in chemical plants, paper mills, breweries and other industries where suspended matter or corrosive fluids must be kept out of meters and meter piping. BULLETIN H-11 shows how it works. Write for your copy today.

CE-117-R

**CONOFLOW CORPORATION**
2100 ARCH ST.
PHILADELPHIA 3 PA.

Cono-Controls

When inquiring check CP 6020 on handy form, pgs. 2-3


North American Philips Co., Inc., Dept. CP, 750 S. Fulton Ave., Mt. Vernon, N. Y. When inquiring specify CP 6021 on handy form, pages 2 and 3.

### *Flexibility of span, zero helps recorder adjust to almost any job . . .*

damping and sensitivity of this instrument can be adjusted, too

**Uses:** Particularly well suited for a wide variety of jobs — especially lab work — where signal is available as a DC voltage.

**Features:** Recorder is extremely versatile. Combination of span and zero-suppression. Allows full-scale readings over a wide range of voltage. Filter and damping adjustment permits control of response, provides for removing spurious AC pickup.

**Description:** Physical appearance of recorder is similar to that of standard models. Principal difference is a row of six knobs mounted near the bottom of the door. First two of these provide coarse and fine suppression adjustment; others, in order, provide span adjustment, sensitivity adjustment, filtering- and damping-adjustment, standardizing adjustment. Multiturn rheostats are located inside door, so that knobs connect with them when doors close. Dials indicate setting to which rheostat contacts are turned.

Ball point pens are used both 1- and 2-second recorders. A jewel tip pen may be substituted in the 2-second model. Terminals can be provided to connect strip-chart motor to an external switch.

(Versatile Electronic Recorder is a development of Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. . . . or for more information check CP 6022 on handy form, pages 2 and 3.)

### *Lists burner-torches and burners*

Bulletin includes specifications and description of burners, burner-torches, gas-air mixers, fishtail burners, blow torches, compound vacuum pumps, and recording counters.

Bul 12-K is issued by Research Vacuum Supply Co., Dept. CP, 3434 Montrose Ave., Chicago 18, Ill. When inquiring specify CP 6023 on handy form, pages 2 and 3.

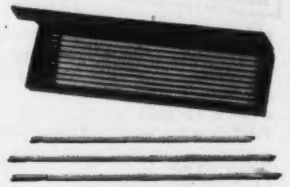

WESTON TAG Thermometers

**in all forms—ranges—stem lengths—connections**

Whether your requirement calls for certified laboratory thermometers . . . or rugged all-metal industrial types . . . or thermometers for remote reading . . . you'll find *exactly* what you require in the Weston-TAG line—*the most comprehensive line of quality thermometers ever offered by ONE manufacturer.* Literature on request. WESTON Electrical Instrument Corporation, 617 Frelinghuysen Avenue, Newark 5, New Jersey.

**Laboratory**



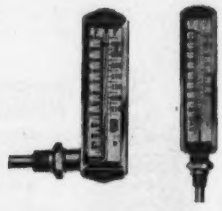


**ALL-METAL**
—have readable, dial-type scales and corrosion-resisting stainless steel stems—stem lengths from 2" to 24"—ranges from low as −100°F. to high as 1000°F.—accuracy ½ of 1% of thermometer range.

**GLASS**
—certified sets of ASTM Testing thermometers with overlapping ranges in protective case. Ranges from −36°F. to high as 760°F. Also precision and standard etched stem thermometers for general testing.

**Industrial**





**ALL-METAL**
—provide unmatched readability and durability—accuracy within 1% of thermometer range. Available in all types, ranges and stem lengths (2½" to 72") for all requirements.

**GLASS (Metal Case)**
—available in all forms, all ranges, stem lengths and connections. Accuracy within one scale division. Also submarine types, metal and cupcase thermometers.

**Remote Reading**





**ELECTRICAL**
—resistor bulb sensing element permits mounting indicator any distance away from point of measurement. *Multiple* remote readings also possible by use of selector switch and several bulbs.

**PRESSURE ACTUATED**
—for remote reading, in 5, 6 and 8" dial sizes. Ranges from low as −325°F. to high as 1000°F. Accuracy one scale division unaffected by vibration or severe shock. Cases of iron, brass, or plastic.

**WESTON** *Temperature Instruments*
9413
**— TO INDICATE — RECORD — CONTROL**

When inquiring check CP 6024 on handy form, pgs. 2-3

# A LONG LIFE and a busy one..

CASH STANDARD Streamlined PRESSURE REDUCING VALVE TYPE 1000

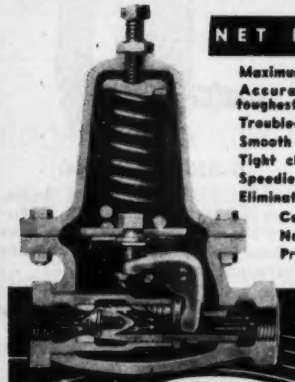
●Long life, and busy too, because this type "1000" valve does not fail—it's as dependable when production continues at high rate, like today, as when things are normal. Streamliners in thousands of plants these past years—and still serving well prove this. One user wrote, "We could not afford to take chances on time out for job repairs, that is why we used your valve on this job."

No trouble from lack of capacity with this valve! Even under peak load, or sharp changes in demand, the aspirating effect gets the valve wide open for maximum flow. Users know this and will vouch for it.

Write today for Bulletin 1000—eight pages of valuable valve facts.

*Streamline Design means*
LESS MECHANISM

The elimination of small ports and passages and complicated mechanism with but few close fitting parts gives you more in service and adds to the life of the "1000" valve.



NET RESULT TO YOU

Maximum capacity when needed most.
Accurate pressure control under toughest working conditions.
Trouble-free service.
Smooth operation.
Tight closure.
Speedier production results.
Elimination of failures.
Cost-saving operation.
No spoilage.
Practically zero in maintenance.




CASH STANDARD CONTROLS.. VALVES

WRITE FOR BULLETIN 1000

A. W. CASH COMPANY
DECATUR, ILLINOIS

When inquiring check CP 6025 on handy form, pgs. 2-3

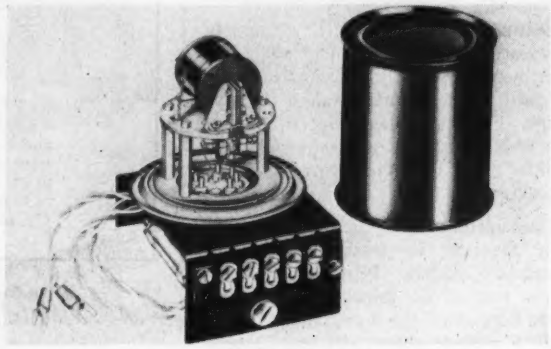

***Chops up tiny DC signal into easily amplified alternating one . . .***

dissymmetry is less than ½ of 1% and frequency can run as high as 3500 cycles per second

**Uses:** Chopping DC signals as small as 0.05 microvolt to produce easily amplifiable AC signals at frequencies from 0 to 3500 cycles per second.

**Features:** Even with very small signals dissymmetry is held to ½ of 1% or less.

**Description:** This component can be used in electrical, electronic, and servo systems. Since contacts are furnished for synchronously inverting DC input and rectifying AC output, unit has been dubbed Synchroverter Switch. Thermal errors are overcome by use of



Helps turn little ones into big ones

two SPDT contacts for signal switching. Neither shock nor vibration is reported to impair operation or life of component.

Contacting armatures are of such small mass that their mechanical response is practically instantaneous. And inverter is reported to be free of resonance effects. Hermetically sealed, it is also protected from dust and corrosion.

(Synchroverter is announced by The Bristol Company, Dept. CP, Waterbury 20, Conn. . . . or for more information check CP 6026 on handy form, pages 2 and 3.)

***Distinguishes $H_2S$, RSH, others and records sulfur content from 0.1 ppm . . .***

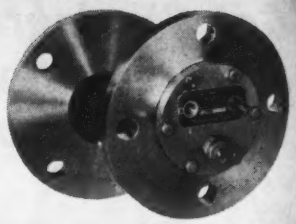
electrolytic instrument responds to any oxidizable sulfur in the gas sample

**Uses:** Detects and records minute or large quantities of any oxidizable sulfur compounds in gases. Instrument is further capable of discriminating between some forms of sulfur. It can distinguish, for example, between hydrogen sulfide, mercaptans, and sulfur dioxide.

**Features:** Recorder has a threshold sensitivity of 0.1 ppm of sulphur in sample gas. It produces 90 per cent response to sulfur level change in the first thirty seconds.

**Description:** Developed for Chemical Warfare Service to detect mustard gas, Titrilog is an extremely sensitive recording instrument. Full-scale sensitivity is adjustable over wide limits. A three-fold extension is provided by selector switch and still greater extension of range can be attained by adjusting flow rate of


# clogging or corrosion troubles?



TAYLOR LIQUID LEVEL TRANSMITTER

**Want to measure accurately** the level of liquids that are corrosive or viscous—or contain solids? The Taylor 229R Liquid Level Transmitter is a force-balance unit specifically designed to measure pressure and liquid level of viscous or corrosive liquids and liquids containing solids. No levers or cams, so no frictional error. It's adaptable to open as well as closed tanks, under pressure or vacuum, and can be attached to the bottom or side of the tank to give accurate level measurement. Air output can be connected with an indicator, recorder or controller as much as 1,000 feet away from transmitter.

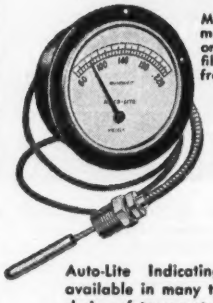
Ask your Taylor Field Engineer or write for **Bulletin 98069.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

*Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.*

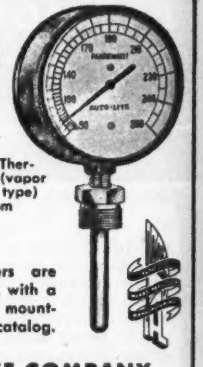
TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

When inquiring check CP 6027 on handy form, pgs. 2-3

*Depend on* AUTO-LITE
FOR TEMPERATURE INDICATION



Model G Thermometer (one-to-one ratio, liquid filled type) Priced from $18.



Model V Thermometer (vapor pressure type) Priced from $10.25.

Auto-Lite Indicating Thermometers are available in many types and sizes, with a choice of temperature ranges and mountings to meet your needs. Send for catalog.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION • TOLEDO 1, OHIO
NEW YORK CHICAGO SARNIA, ONTARIO

AUTO-LITE
INDICATING & RECORDING THERMOMETERS

When inquiring check CP 6028 on handy form, pgs. 2-3

"SERV-RITE"

Insulated Thermocouple Wire Extension Lead Wire

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CHROMEL ALUMEL
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No matter what your wire or insulation requirements may be, you can depend on Gordon "Serv-Rite" insulated wire for pyrometers—recognized as a standard of highest quality for nearly half a century. All "Serv-Rite" wire is now manufactured in the new, completely modern Gordon plant, employing up-to-date equipment and machinery, supervised and operated by skilled technicians—your guarantee of continued precision quality. In addition to maintaining large stocks of all common types of wire, Gordon will manufacture special insulation, in long or short runs, to suit your individual needs and meet your most rigid specifications.

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Dept. 19 2035 Hamilton Ave., Cleveland 14, Ohio

When inquiring check CP 6029 on handy form, pgs. 2-3

sample. Used to monitor gas for odorants, recorder can produce full-scale deflection for 0.5 grains of mercaptan sulfur per 100 cu ft of gas.

Sample stream is continuously bubbled through a solution contained in reaction cell. Reactive sulfur compounds are absorbed from stream by the solution. Continuous chemical reaction goes on between absorbed sulfur and bromine generated electrolytically. Sensing electrodes constantly detect balance of the system and control bromine production to hold this balance. The current required to generate bromine is the actual quantity recorded. It varies directly with amount of sulfur in sample stream.

Three fluid absorbers incorporated in the instrument can be used to absorb specific sulfur compounds before sample enters measuring cell. Means are provided for automatically routing sample through any of these filters. Sample may be passed, for instance, through an $H_2S$ absorber, through both $H_2S$ and mercaptan absorbers, or through no absorber at all. Instrument will cycle through these operations automatically, taking about 15 minutes for each step.

Titrilog may also be modified to record total sulfur in four different sample streams. Cycling operation uses the automatic section mentioned above.

Instrument is available in stationary or portable models, both requiring 110 v, 60 cps power. Where need for such monitoring may be temporary, manufacturer's rental service provides supplies, instruction, and engineering service in addition to the instrument itself.

(Titrilog is a product of Consolidated Engineering Service, Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . . or for more information check CP 6030 on handy form, pages 2 and 3.)

***Three-wire system transmits temperature electronically with compensation . . .***

ambient temperature compensation is made by third wire

Temperature transmitter consists of two essential parts—resistance thermometer element and thermometer adapter unit. Thermometer element is made of pure platinum wire wound on a ceramic core and sealed in an Inconel tube. Several thermo-well types are available: standard, lagging extension, or finned.

Thermometer adapter unit converts resistance changes to a 60 cps AC signal. Voltage is directly proportional to temperature, has full scale range from 0 to 0.5 volts. Three wires are used to connect thermometer element to adapter unit. This wire system compensates for variations in lead wire resistance with ambient temperature change. A special adjustment compensates for minor changes in resistance of thermometer element.

Adapter unit features a removable range card and it can be set for any of 14 ranges (span: 50°C). Limiting temperatures are −50° to 325°C. Smaller numbers of larger spans in the same general temperature range are also available. Similar units may be obtained for Fahrenheit measurements.

(Type T2T Autronic Temperature Transmitter is a development of The Swartwout Company, Department CP, 18511 Euclid Avenue, Cleveland 12, Ohio . . . or for more information check CP 6031 on handy form, pages 2 and 3.)

you can have NOW . . . an annunciator system to answer FUTURE problems...



Don't let your annunciator system be "frozen" at the design stage or even after installation. So often varied requirements are recognized only after a plant is in operation.

New Universal PANALARM "50" offers the greatest degree of flexibility ever achieved in an annunciator system. This new design not only incorporates basic mechanical and electrical operating improvements. But, it also has built-in versatility capable of simple changes to other operating sequences, functions and forms . . . without re-wiring . . . without change of cabinet or the plug-in units.

Universal PANALARM "50" provides the flexibility you must have in an annunciator system today, and in providing for the future. Send for new catalog No. 100

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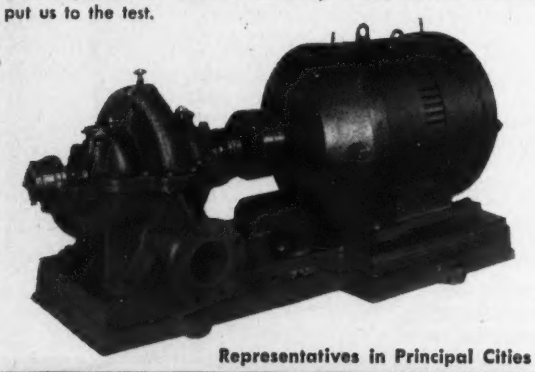
When inquiring check CP 6032 on handy form, pgs. 2-3

"Pumps in our plant? I leave their selection and installation up to a WEINMAN PUMP SPECIALIST"



Chemical processors everywhere agree this is sound advice.

That's because WEINMAN specializes in pumps . . . for more than 50 years has designed, constructed and installed only one product . . . centrifugal pumps. WEINMAN SPECIALISTS know pumps, and know how the proper application of WEINMAN pumps can put your liquid handling operations on a worry-free, profitable basis. WEINMAN PUMP SPECIALISTS recognize that every installation calls for personalized application of basically designed pumps. No matter how challenging the conditions, they can confidently recommend a WEINMAN pump that will meet your requirements. Prove it? Certainly! Write, wire or call and put us to the test.



Representatives in Principal Cities

Built by Centrifugal Specialists

The WEINMAN Pump Mfg. Co.

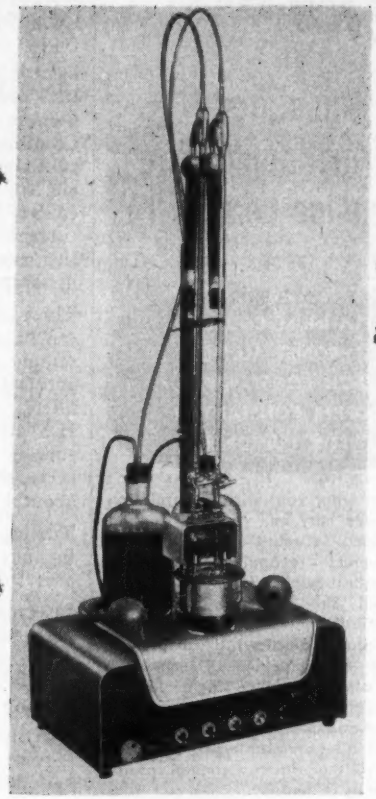
294 SPRUCE STREET • COLUMBUS 8 • OHIO

When inquiring check CP 6033 on handy form, pgs. 2-3

*For the Laboratory*

# Redesign of Moisture Tester Fits Karl Fischer Method To Still More Uses

**Present version is a true "pushbutton" device**



Electromagnetic valve stops titration when endpoint is reached

THOUGH the Aquameter is still a comparatively new instrument, it has been extensively revised. Sensitive relay of older model has been replaced with a line-operated amplifier and instrument now uses null detection.

Karl Fischer method is ideal for moisture tests because, with the Aquameter, determinations require only a few minutes. In addition, accuracy is frequently better than that of oven or distillation methods. This instrument has been used satisfactorily on paper, pharmaceuticals, petroleum products, other oils, foodstuffs, alcohols, ethers, and anti-biotics. It can be applied to almost any routine moisture test.

Fully automatic, revised instrument completes direct or back titrations in one or two minutes with precision of 0.05 milliliter or better. This precision can be attained even where simultaneous extraction and titration are required.

Line-operated amplifier responds to change in resistance between electrodes as endpoint is approached. Endpoint is not affected by variations in line voltage or in stirring.

Other changes in the revised instrument include replacement of special three-necked flask with a conventional beaker. Detachable silicone-rubber seal fits over beaker to exclude air. One-liter reagent reservoir has been replaced with a two-liter vessel. And a variable-speed magnetic stirrer has been built into unit.

Karl Fischer reagent is added to sample, during run, by an electromagnetic valve. This valve controls flow from buret in accordance with signal current from the electrodes. As endpoint is neared, moisture in solution is diminished, causing electrodes to depolarize. As current increases with this depolarization, it cuts flow from buret by closing valve.

Repeated titrations can be run in this manner without resetting, checking, or restandardizing the instrument. When standardization is required, it is conveniently accomplished with sodium tartrate dihydrate. Tests on solid, slow reacting, or high moisture content samples can be run by back titration. Selector switch on instrument converts it to this type of operation. Special buret and flask assembly interchange with standard parts.

In operation, Aquameter halts flow of water-methanol titrant when endpoint is sensed by decrease (rather than increase) in signal current.

(Aquameter information is contained in Bul 276-11 prepared by manufacturer, Beckman Instruments, Inc., Dept. CP, 820 Mission St., South Pasadena, Calif. . . . or for more information check CP 6034 on handy form, pages 2 and 3.)

## Small enough to fit on lab bench, tester supplies loads to 1000 lb and reads within 5 lb

**It has a low range too, reading to nearest half-pound up to rated capacity of 100 pounds**

USES: Specially designed for "flat crush" and "column compression" tests of paper and corrugated board, this testing machine is nonetheless adaptable to a wide variety of compression tests up to its maximum range of 1000 pounds.

**Features:** Load scale is large and lineal. It is placed at eye level (when tester is bench mounted) for ease of reading.

**Description:** Multi-Purpose Compression Tester has a dual load range. Low range is 0 to 100 pounds; high range, 0 to 1000. Tester handles specimens as large as 12 x 12 x16 inches high. Upper platen is the traveling



Only two controls

platen — its speed is continuously variable between 0 and 2½ inches per minute. All four columns (see cut) guide platen travel. Propulsion is accomplished by two screws rotating in fixed nuts.

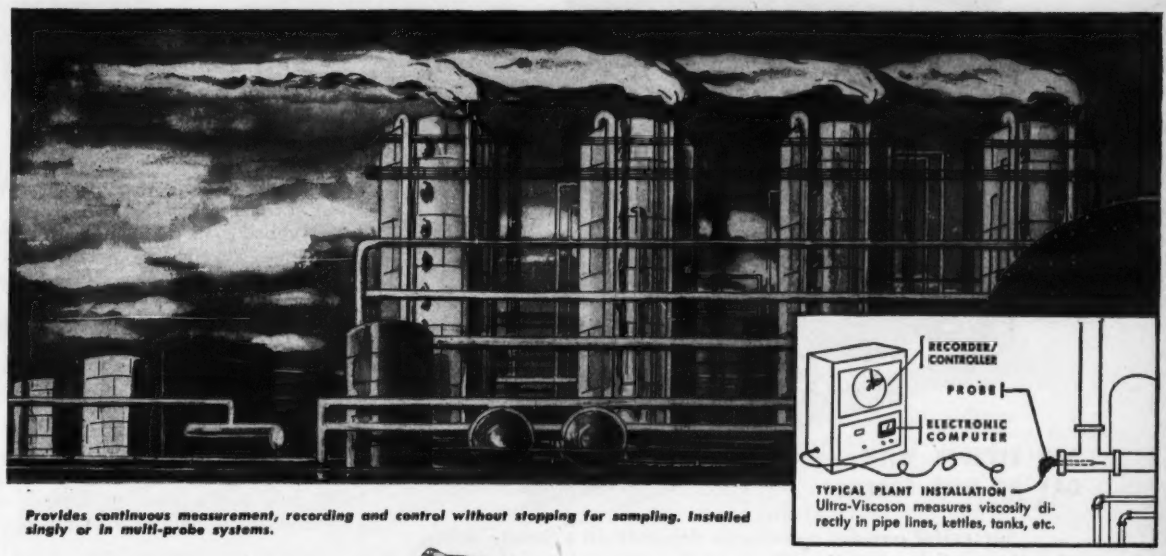
Weighing system includes two steel levers with hardened knife-edges. These are linked to a pendulum whose directly attached actuator arm moves a maximum load indicator. Adding a ballast weight to the pendulum changes tester from low to high range. Operation is simple, involves only two controls. Snap-action switch has "up-off-down" position to control platen travel. Dial controls platen speed.

The 24 x 20 x 30 inch high tester is powered by a ⅛-hp motor operating from 110v. .

(Tester is available through Fisher Scientific Company, Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 6035 on handy form, pages 2 and 3.)


# PROBE INTO IT...

## *measure • record • control* VISCOSITY *continuously*




*Provides continuous measurement, recording and control without stopping for sampling. Installed singly or in multi-probe systems.*



**AUTOMATICALLY MEASURES VISCOSITY WITH ULTRASONICS**

- **No moving parts. Simple. Reliable.**
- **Hermetically sealed probe.**
- **Temperature: Up to +650°F**
- **Pressure: Vacuum to 1000 p.s.i. (special units available for higher pressures)**
- **Controls quality: Electrical output of computer actuates recording and control systems.**

Join the increasing number of Ultra-Viscoson users. A partial list includes —

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**probe into it . . . with**

**ULTRA-VISCOSON**

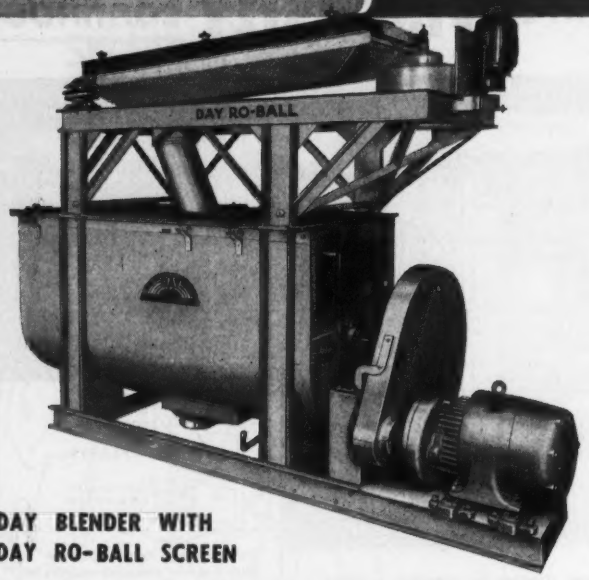
*A product of the Rich-Roth Laboratories.*

**THE ULTRA-VISCOSON CORPORATION**
673 Connecticut Blvd., East Hartford 8, Conn.

When inquiring check CP 6036 on handy form, pgs. 2-3

ACCURATE SIZING
PROPER DENSITY
THOROUGH BLENDING

*Successful Powder Metallurgy*




**DAY BLENDER WITH**
**DAY RO-BALL SCREEN**

**Successful powder metallurgy depends on accurate sizing of metal particles, proper density of the compact and thorough blending to insure homogeneous structure. The DAY Blender, teamed with the DAY Ro-Ball Screen, meets all three of these vital requirements.**

**The DAY Blender's sturdy construction features heavy channel legs, outboard bearings and stuffing boxes and a rugged tank of plain, galvanized or stainless steel. Dependable drive is provided by a heavy-duty geared motor. Center discharge is standard.**

**The DAY Ro-Ball employs the exclusive Super-Active Ball Cleaning principle for evenly distributed vibration over the entire screen area. This design permits use of finer mesh and keeps the screen open for fast, efficient operation.**

**DAY DRY COLOR AGITATOR**

**Rugged construction, scientifically designed for thorough radial and two-way lateral mixing action. Available in plain, galvanized or stainless steel.**



***For specific applications ask about DAY'S complete line of Double-Arm Mixers, Blenders, and Change-Can Mixers.***

DAY

**THE J. H. DAY COMPANY, CINCINNATI 22, OHIO**
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**1143-A Harrison Ave., Cincinnati 22, Ohio**

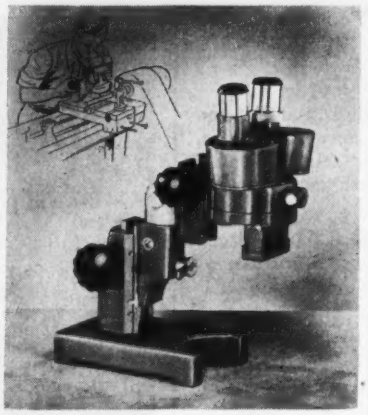
When inquiring check CP 6037 on handy form, pgs. 2-3




***Consulting service explores stereomicroscope uses in routine work . . .***

aims at finding new uses for unique inspection method

In order to explore recent developments in optics, a free consulting service has been set up. Its chief goal will be finding ways of using advantages of the stereomicroscope. And special attention will be paid to production and quality control problems.



Typical stereomicroscope

Among the industries to which this service is offered are ceramics, chemical, petroleum, paper, rubber, and textile.

Stereomicroscopes are available in a wide variety of specifications — wide fields, large working distances, and a whole range of magnifications are available. A typical application, for example, might call for a 10 diam magnification with a 20 mm field and a working distance of 95.9 mm (3¾"). Other combinations provide up to 150 diam.

Industrial stereomicroscopes permit comfortable observation, enlarged image, wide field, long working distance, and offer easily interpreted three-dimensional qualities. They also permit adjustments for inter-pupillary distance.

(Consulting Service is offered by Bausch & Lomb Optical Co., Dept. CP, Rochester, N. Y. . . . or for more information check CP 6038 on handy form, pages 2 and 3.)

***Colorimeter measures efficiency of detergents in laundering of test samples . . .***

unit designed to measure accurately in spite of non-uniformity of soil on fabric samples

**Uses:** Effectiveness of detergents may be measured by color changes before and after laundering.

**Features:** Unit measures large sample area to insure accuracy in spite of non-uniform condition of sample. Instrument may be adjusted to measure or exclude fluorescent effects of dyes.

**Description:** The Gardner Large Area Colorimeter is an adaptation of the Gardner Color and Color Difference Meter. Size of sample exposure head has been increased to permit measurement of larger area of sample to offset non-uniformity of soiling. Exposure area measures 9" x 12" in size.

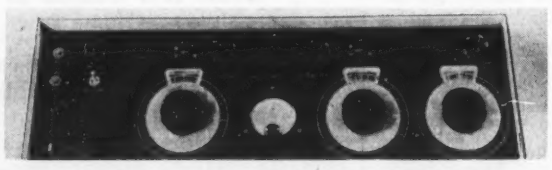


Photo illustrates recessed control panel of colorimeter


PLA-TANK®

**Resin-Bonded Fiberglas®**

**DUCT-WORK**

**is**

**LIGHT, easy to erect**

**STRONG, needs less support**

**RESISTANT to many corrosive fumes**

**ECONOMICAL, made in stock units**

**VERSATILE, may be custom-molded**

**AVAILABLE, from new larger plant**

**ACCEPTED by the chemical industry**

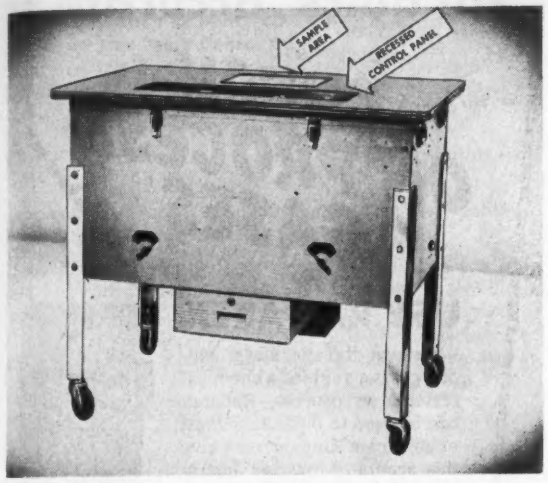
**PROVED in actual service**

**Check up on PLA-TANK for new duct jobs now on your drawing-boards - - or for replacements of existing systems.**

***Write for free data sheet file***

THE *Chemical* CORPORATION
63 Waltham Ave., Springfield 9, Mass.

When inquiring check CP 6039 on handy form, pgs. 2-3



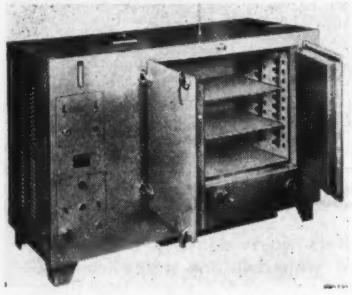

Colorimeter measures effectiveness of detergents

Colorimeter is equipped with special filters which may be used to eliminate any ultra-violet radiation of tungsten source. This method allows measurement of detergent properties without including effects of fluorescent dyes. Ultra-violet source may be used to accentuate effects of fluorescent dyes. Special measuring circuit is used to read blue reflectance.

(Gardner Large Area Colorimeter is a product of Gardner Laboratory, Inc., Dept. CP, Bethesda 14, Md. . . . or for more information check CP 6040 on handy form, pages 2 and 3.)

***Even circulation of air in oven assures more uniform control at all temperatures . . .***

as temp rises, mechanical convection design compensates by providing increased air flow



Gives uniform air circulation at all temperatures

Uses: For general and analytical laboratory work requiring use of mechanical convection oven for preheating and aging, sterilizing, dehydrating, drying and baking, etc.

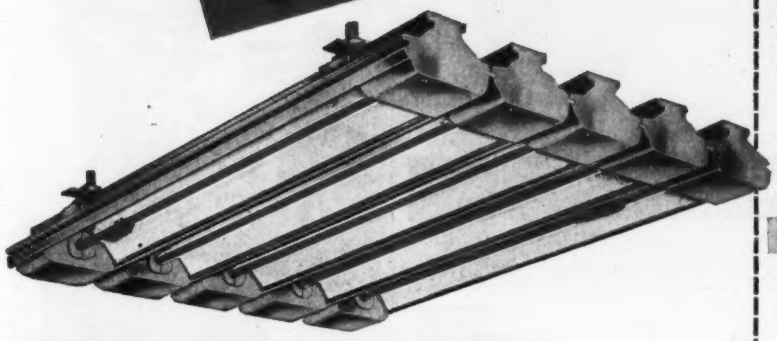
Features: Automatically provides constant air weight circulation at all temperatures and with no increase in motor hp.

Description: With a working range of 35-288°C, (95-550°F) Con-Wate mechanical convection ovens incorporate the following improvements: 1) minimized test chamber stratification, 2) elimination of surface burns, 3) visual evidence of air flow conditions, 4) no blower noise or vibration, and 5) longer lasting heater elements and air blowers.

(Development of the Emil Greiner Co., Dept. CP, 20-26 N. Moore St., New York 13, N.Y. . . . or for more information check CP 6041 on handy form, pages 2 and 3.)


**CHROMALOX** *gives you* **the LOW COST answer**

*for* variable heat non-breakable infrared safe operation



**CHROMALOX**

**all-metal**

electric **radiant heaters**

Get all the advantages of infrared heat and more—at a fraction of former costs with the new and improved CHROMALOX heating principle. All-metal construction, high heat intensity, infrared radiation that's "color blind" and heat that's infinitely variable, have proved CHROMALOX Radiant Heaters superior for over 300 different uses in more than 1500 plants. If you use heat for baking, drying, preheating, curing, degreasing and similar applications, CHROMALOX Radiant Heaters can very likely give more satisfactory results. See for yourself how these infrared units up output, improve uniformity, reduce costs.

CHROMALOX

*Electric Heat for Modern Industry*

**Time, money and material saving applications**

**FOR MORE INFORMATION**
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**PLASTICS**
- ☐ Drying powders
- ☐ Drying Cellophane
- ☐ Preheating strips
- ☐ Preheating cloth
- ☐ Curing vinyl
- ☐ Post-forming
- ☐ Curing tubing

**METALS**
- ☐ Heating molds
- ☐ Degreasing
- ☐ Paint baking
- ☐ Drying piston rings
- ☐ Baking wrinkle paint
- ☐ Welding preheating
- ☐ Drying automotive parts
- ☐ Preheating steel rolls
- ☐ Dehydrating refrigeration coils

**GLASS**
- ☐ Drying bottles
- ☐ Heating safety glass
- ☐ Setting dye on glass cloth
- ☐ Preheating lenses
- ☐ Drying mirrors

**ELECTRICAL**
- ☐ Baking armatures
- ☐ Drying marine equipment
- ☐ Sealing headlights and television tubes
- ☐ Drying varnished wire
- ☐ Drying carbon resistors
- ☐ Drying color coding

**FOUNDRIES**
- ☐ Drying sand cores
- ☐ Skin drying of molds
- ☐ Comfort heating

**FOOD**
- ☐ Warming
- ☐ Drying baking pans
- ☐ Dehydrating crackers
- ☐ Baking biscuits
- ☐ Dehydrating coconuts

**TEXTILE**
- ☐ Dehydrating braided material
- ☐ Drying Nylon thread
- ☐ Dehydrating woolen cloth
- ☐ Setting flock

**RUBBER**
- ☐ Curing
- ☐ Heating rubber glue
- ☐ Curing latex

**PRINTING**
- ☐ Ink drying
- ☐ Static elimination
- ☐ Glue drying
- ☐ Drying varnished paper
- ☐ Silk screen drying

**CERAMICS**
- ☐ Drying frit
- ☐ Drying glaze
- ☐ Drying pottery

**MISCELLANEOUS**
- ☐ Sealing storage batteries
- ☐ Setting adhesives and cements
- ☐ Curing tobacco
- ☐ Melting wax
- ☐ Drying photographic negatives and prints
- ☐ Dehydrating kraft paper

**and many other Applications**

**EDWIN L. WIEGAND CO.** Radiant Heater Division
7517 Thomas Boulevard, Pittsburgh 8, Pa.

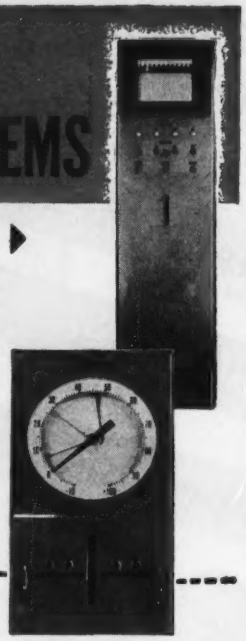
I am interested in infrared heat for_____

- ☐ Send me application file on uses I have listed.
- ☐ Ask factory representative to contact me.
- ☐ Send Chromalox Catalog on Industrial Heaters.

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Company_____
Address_____
City_____ Zone____
State_____ IC-81

When inquiring check CP 6042 on handy form, pgs. 2-3

# A COMPLETE LINE OF GAS ANALYSIS SYSTEMS



**THERMOCOUPLE TYPE PRECISION COMBUSTIBLE GAS ALARM SYSTEM**

**Tube Sampling—Indicating or Recording**

Protects 4 to 8 danger spots with one installation! Specified where explosive concentrations do not reach critical levels rapidly. Details in our Bulletin 11-86TS.

**RECORDING THERMOCOUPLE TYPE PRECISION COMBUSTIBLE GAS ALARM SYSTEM**

A packaged unit for the protection of processes, plants, personnel. A new, more accurate principle of gas analysis. Improved zero stability. "Fail-Safe" construction. Write for bulletin No. 11-86.

Also—Gas Analysis Instruments Utilizing The Principles of Thermal and Electro Conductivity

*Our engineers will be glad to serve you.*

INSTRUMENT DAVIS DIVISION

DAVIS EMERGENCY EQUIPMENT CO., INC.

56 HALLECK ST., NEWARK, 4, N. J.

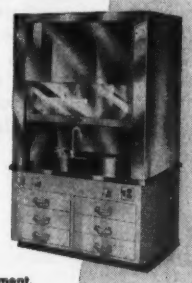
When inquiring check CP 6043 on handy form, pgs. 2-3



*for your New Laboratory, or ... for Expansion*

# METALAB offers you *the Finest in* LABORATORY EQUIPMENT WITHIN YOUR BUDGET





Let Metalab advise you on

- *How to plan your Laboratory for greater efficiency.*
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When inquiring check CP 6044 on handy form, pgs. 2-3


## FOR THE LABORATORY

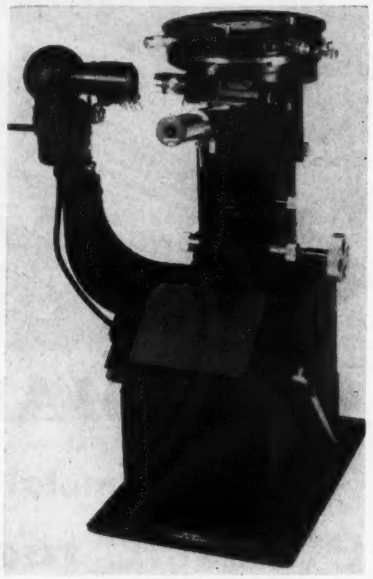
***Single unit combines camera microscope, hardness tester . . .***

accessory permits examination of materials in phase contrast

**Uses:** Metallic specimens may be examined microscopically and photographic record of sample made at same time. Sample may be examined for flaws by phase contrast. Micro hardness determination may be made with accessory unit.

**Features:** Accessory permits sample to be examined in phase contrast. Unit is completely self-contained.

**Description:** The Reichert Universal Camera Microscope "MeF" is completely self-contained unit consisting of all necessary elements for microscopic and photographic examination. Attachments are available for transmitted and reflected polarized light. In addition, the Reichert Micro Hardness Tester enables the operator to determine hardness of entire sample or of individual crystals. Hardness is expressed in terms of Vickers units.



Metallograph is shown equipped for examination with reflected light only

Picture size of camera is 3-½" by 4-¾" and no enlargement is necessary. Magnification may be continually changed.

(Reichert Universal Camera Microscope "MeF" and accessories are distributed by William J. Hacker and Co., Inc., Dept. CP, 82 Beaver St., New York 5, N. Y. . . . or for more information check CP 6045 on handy form, pages 2 and 3.)


# For quick, accurate CHECK ON PROCESS GASES

**USE RANAREX**

Whenever the specific gravity of a gas is a guide to a chemical reaction or process, Ranarex can be used to indicate, record or control it. Find out now how this accurate, low-cost instrument can help *you!*

Write to The Permutit Company, Dept. CP-11, 330 West 42nd St., New York 36, N.Y.



RANAREX®

PRODUCT OF THE PERMUTIT CO.

When inquiring check CP 6046 on handy form, pgs. 2-3





IMMEDIATE DELIVERY

on *Pyrex* Brand HEAT RESISTANT SIGHT GLASSES

Now, Swift offers fast delivery on SIGHT GLASSES, cut or ground in any shape from PYREX Brand Heat-Resistant Polished Plate Glass.

For use on ovens, absorption columns, evaporators, stills, pressure vessels, etc. Resists clouding, pitting, chemicals (except HF and strong, hot caustic solutions). Supplied in rounds, squares, rectangles, and odd shapes in 8 thicknesses (⅛" to 1") and any size up to 24" x 60".

Write, wire or phone for quotation — ask for SIGHT GLASS bulletin.

SWIFT LUBRICATOR CO., INC.

330 TENTH ST., SAN FRANCISCO 3 • ELMIRA, N. Y.

36 OLIVER ST., BOSTON 10

When inquiring check CP 6047 on handy form, pgs. 2-3

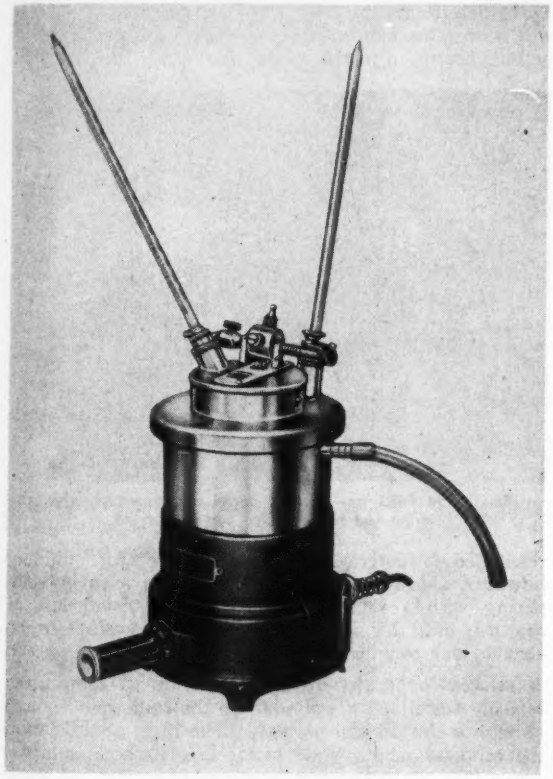
***Better accuracy of temp control in closed cup tests achieved with electric heater . . .***

for the range from 100 to 700°F; it can be used with gas flame or oil wick to touch off flash

**Uses:** Determining closed cup flash points for solvents, etc, in the range up to 175°F.

**Features:** Good temperature accuracy is achieved over this wide range.

**Description:** Closed cup tester is designed for flash and fire point determinations of flammable liquids flashing below 175°F in accordance with ASTM Method D-56. Only open flame present is that of gas tip used to initiate the flash. Heating is taken over by an



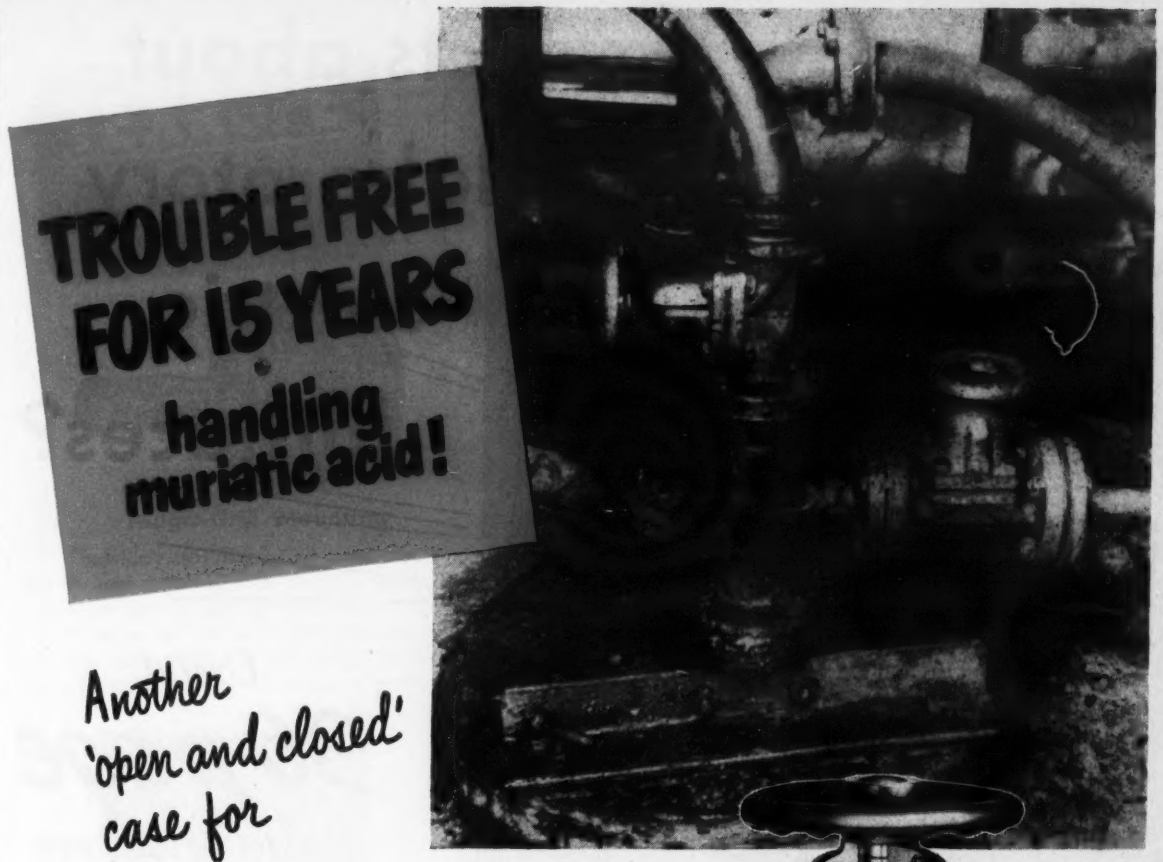
For flash points up to 175°F

electric hot plate. Essentially unit is design specified by Government Master Specifications, National Oil, Paint and Varnish Manufacturer's Assn. and ASTM.

Hot plate is provided with a metal collar which supports a water bath in which the standard oil cup is suspended. Heater temperature range is 100 to 700°F. Gas tip igniter can be furnished with an oil-wick pilot if desired. Pressing handle on cover mechanism opens port and introduces flame into the oil cup.

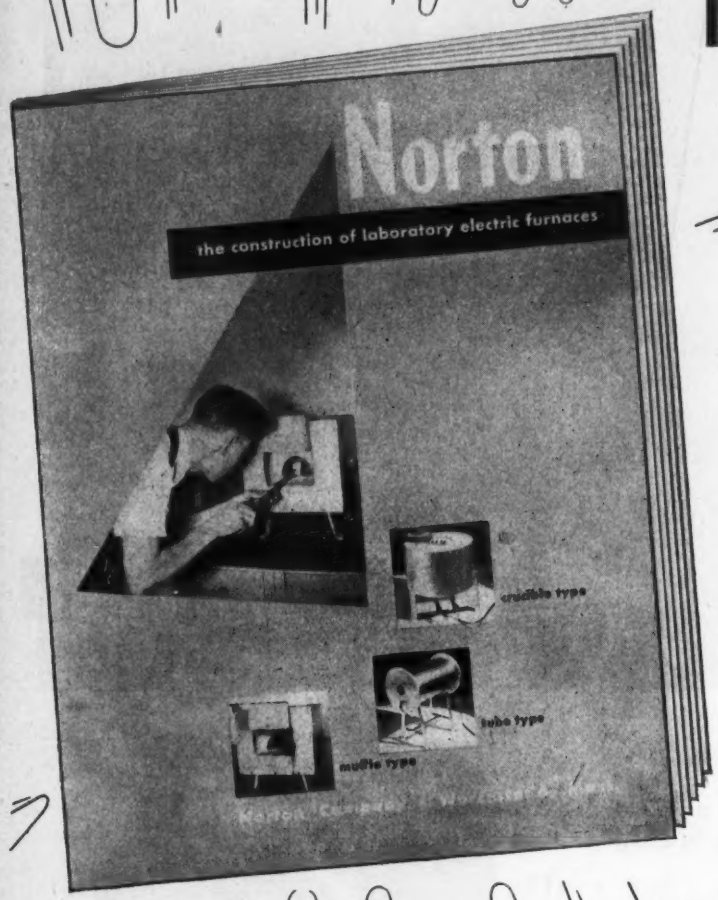
Closed cup tester is made of stainless steel and brass; hot plate and support collar are steel with a corrosion-resistant coating. Cord plugs in to 115v, 50/60 cps. Overall dimensions are 8¾" high by 4¾" diameter.

(This Electric Flash Tester will shortly be available in quantity from Precision Scientific Company, Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. . . . or for more information check CP 6048 on handy form, pages 2 and 3.)

When inquiring check CP 6049 on handy form, pgs. 2-3

# Know the facts about laboratory electric furnaces?




*Useful*

## 36-page

*booklet brings you authoritative data on high temperature furnaces... shows how to build them...contains practical, easy-to-use diagrams, charts, tables*

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Find out now how you can put electric furnaces to work for you . . . in the analytical, chemical or research laboratory. Learn the facts on the three basic types of laboratory furnaces . . . how to construct them. Use the many diagrams, charts, tables as basic guides in constructing furnaces that are scientifically accurate.

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When inquiring check CP 6050 on handy form, pgs. 2-3



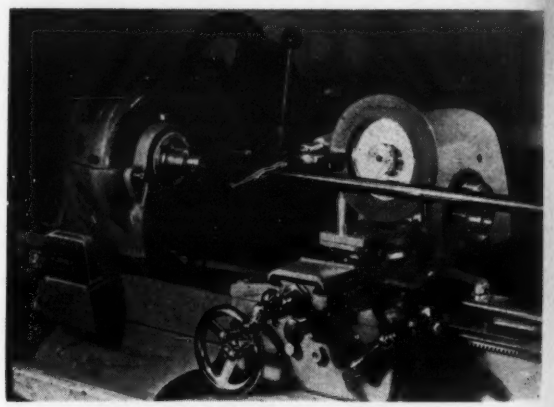

***Wear resistance of coatings on cylindrical objects easily tested . . .***

machine adjusts for specimens from ½ to 6" diam and from 8 to 36" in length

**Uses:** For rating wear resistance of protective finishes, (black oxidized or electroplated coatings, extruded plastic and enamel applied to aircraft, ordnance and metal furniture tubing, and other cylindrical parts or test pieces).

**Features:** Machine adjusts to include cylindrical specimens from ½ to 6" diam, 8 to 36" in length. Width of 1" wear track can also be adjusted to wear a track ½" wide where required.

**Description:** Cylinder Abrasion Tester (Model W-3981) determines the number of wear cycles the surface will withstand before penetration of protective finish permits corrosion to take place. End point for corrosion



Blue oxide finish on 34" gun barrel undergoes wear-handling test to determine corrosion point

resistance is determined with an indicator solution, however, a visual end point can also be used by comparing with a standard. Electric counter at left of operator indicates wear cycles (One wear cycle is equivalent to one complete revolution of the abradant wheel).

A refacer for the abradant consists of a motor-driven refacing wheel and a mounting on the main spindle shaft to receive the abradant wheel. The main spindle turns the calibrase wheel while motor-driven wheel is moved across face of the abradant by means of a hand-fed screw.

(Development of Taber Instrument Corp., Dept. CP, 106 Goundry St., North Tonawanda, N. Y. . . . or for more information check CP 6051 on handy form, pages 2 & 3.)

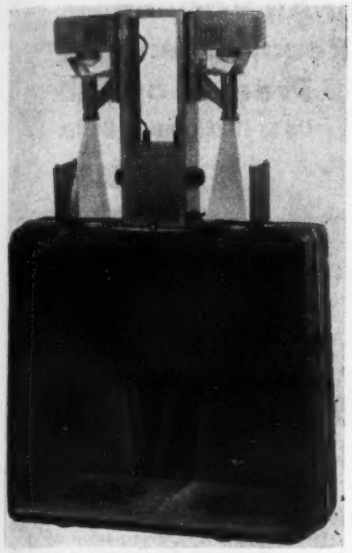
***Determines condition of surface in any location — requires only electric power . . .***

portable comparator has 30 diam magnification and gives three-dimensional effect

**Uses:** For making comparative studies of surface conditions.

**Features:** Compact unit is portable, projects replicas to 30 diameters and with three-dimensional effect.

**Description:** Faxfilm Surface Comparator (Model BL-122) makes possible study of surface conditions in about a minute by use of a clear plastic replica of the



Shows surface condition with three-dimensional effect

surfaces to be considered. The comparator measures 25 x 12" at the base, 22½" high. Total weight, including an accessory and file case, carried in the base of the unit, is less than 30 lb. Specially-designed micro-projectors use Wollensak 1" f:1.9 projection lenses.

For travel use, when comparison projection is not required, one projector may be removed from the large unit and carried in the small accessory case. This arrangement would provide a complete unit (materials, working area, file tray, screen and projector) in an 11½ x 10 x 4" case and weighing less than 8 lb for compact carrying in a suitcase.

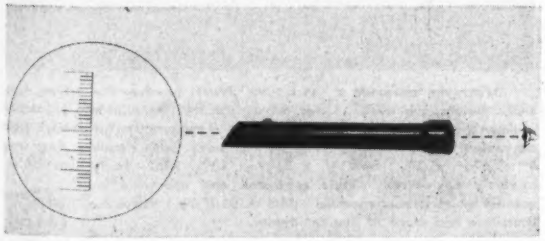
(Surface comparator is a product of The Brush Development Company, Dept. CP, 3405 Perkins Ave., Cleveland 14, Ohio . . . or for more information check CP 6052 on handy form, pages 2 and 3.)

***Quickly measures grains to about 0.002-inch or smaller . . .***

etched scale of pocket microscope allows size estimation to nearest 0.0005-inch

Uses of the Optometer within any industry are usually rather specialized, but typical examples include measurements of particle size, finding diameters of Brinell indentations, checking wear of Fourdrinier wires or finding fiber length and pigment dispersion in paper.

Instrument resembles a typical pocket microscope, looks much like a fountain pen. Fixed magnification is 50 diameters. But the essential feature is the engraved

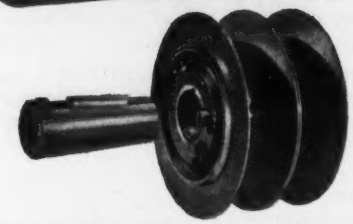


scale mounted in its body tube. Achromatic lenses produce a sharp image of subject with dimension scale superimposed. Graduations of scale are 0.002".

(Optometer is manufactured by National Instrument Co., Dept. CP, 5005 Queensbury Ave., Baltimore 15, Md. . . . or for more information check CP 6053 on handy form, pages 2 and 3.)


TEXROPE

Greatest Name in V-Belt Drives



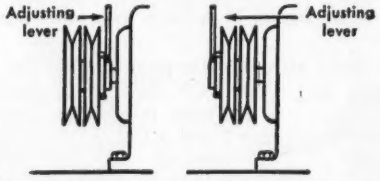
**1 *Magic-Grip* Mounting**

The widely used *Magic-Grip* tapered bushing is now supplied with the Wide Range *Vari-Pitch* sheave, making it the fastest mounting sheave of its type on the market. Turning only one screw makes or breaks the vise-like grip of sheave bushing on motor shaft.



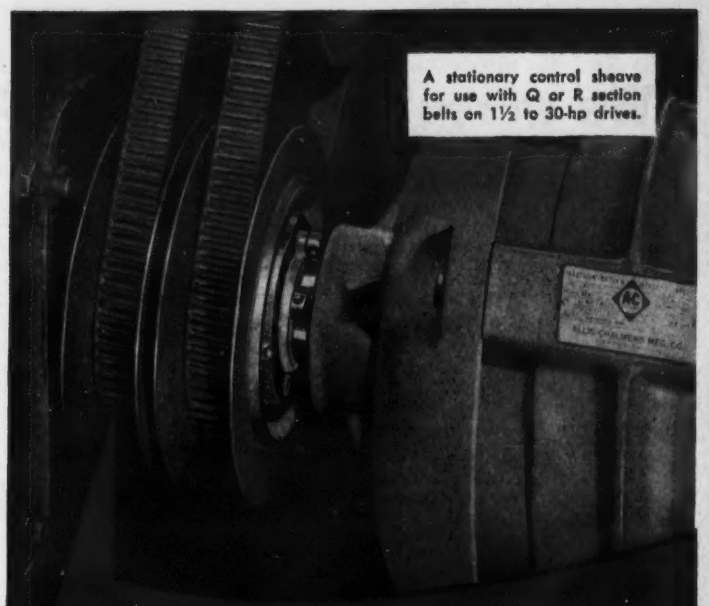
**2 Fast Adjustment**

To change sheave diameter — thereby changing speed — simply turn a single adjusting screw, *using a lever rod* that slips through a hole in the head of the screw. No more fumbling with screw drivers. Adjustment is fast and accurate.




**3 Adjusts From Either Side**

Sheave can be mounted on motor shaft so adjusting screw is either toward or away from motor bearing, as indicated above. This feature is especially important in installations where space for adjustment is limited. It's the only sheave of its type with this feature.




# NOW!

## Wide Range Vari-Pitch Sheave has 3 New Advantages

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Send me complete specifications and engineering data on the new Wide Range *Vari-Pitch* sheave . . . 20S7811

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Title.....

Company.....

Street.....

City..... State..... A-3841

*Texrope, Vari-Pitch and Magic-Grip are Allis-Chalmers trademarks.*

**ALLIS-CHALMERS**

When inquiring check CP 6054 on handy form, pgs. 2-3

# We weren't that good ...and we knew it

Five years ago we tried to diagnose our business position. Oberdorfer, mostly under the direction of the family of the present ownership, had been a continuous financial success as a foundry since 1876, and as a mass maker of small pumps since 1897.

The pump division had a record of continuously increasing sales and *no important competition*. Yet something was wrong, because we knew our pumps couldn't be that good. We might be able to go on fooling all of the people for a while longer, but we'd better wake up before they did! We just weren't that good! We realized that what we needed — and quickly — was a dose of sound preventive medicine.

Business doctors were available. So were engineers, technicians, economists, financial wizards and crackpots — all at a price. Our decision was to scrap this group and simply use all the brains God had passed out to us.

We weren't brilliant, so it took a long time. But five years later we have married a unique type of quality production to an unusual kind of service to produce a very interesting line of pumps at a very interesting cost. Early in 1953, the offspring of that marriage will first be placed on the market in substantial quantities.

We know now that we possess the formula for a new business medicine as effective as the antibiotics when compared with our former cathartic cureall. Many times longer-lived, all-bronze Oberdorfer Pumps, with interchangeable parts machined to a fraction of a thousandth of an inch, will soon be available throughout the free-trading world at a very low price.

**OBERDORFER BRONZE PUMPS**

Industrial Pump Div.
Oberdorfer Foundries, Inc.
6211 Thompson Rd.
Syracuse, New York

Please send a preview of the corrosion-resistant all-bronze Oberdorfer pumps to be available in 1953.

Name.....

Company.....

Address.....

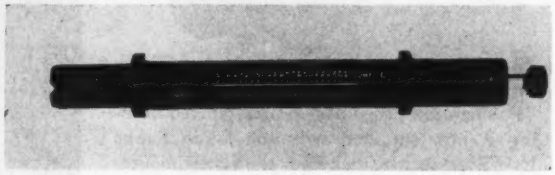
When inquiring check CP 6055 on handy form, pgs. 2-3


***Pocket size hardness tester has only two moving parts for simple operation . . .***

device offers all features of standard heavy units plus portability and convenience

**Uses:** Tester is used for testing of internal mold and die sections. Unit has been used to test such materials as fiber-glass laminates, plastic sheet stock, wood, hard rubber, and many others, as well as conventional testing of steel and non-ferrous materials.

**Features:** Pocket size device weighs only 7 ounces in comparison with standard heavy equipment which weighs hundreds of pounds. Can be used to test internal mold and die sections with areas as small as one



Hardness tester allows direct readings to be made in Rockwell or Brinell units

square inch. Method causes less marring of surfaces than penetration testing. Allows testing of samples without removal of sample from metal working machine. Scales permit direct reading.

**Description:** Hardness tester is simple to operate and has only two moving parts. For calibration and for use with parts weighing less than 15 pounds, clamping anvil is supplied in order to provide sufficient mass to obtain full rebound. Maker claims accuracy of order of that obtained with standard heavy equipment.

Current unit allows direct readings on any of three different Rockwell and Brinell scales without use of conversion charts. Two models are available, one for steel and one for use on non-ferrous surfaces.

Design of instrument allows samples to be tested in metal working machines. Lifting equipment to bring heavy sections to orthodox testing equipment is not necessary as device is completely portable.

There are no diamond points to grind or wear out, and no penetrating balls to deform. Rebound method of testing causes less marring of surfaces than other standard methods.

(Pocket Size Metal Hardness Tester is a product of Peabody Industries, Inc., Dept. CP, 1819 Broadway, New York 23, N. Y. . . . or for more information check CP 6056 on handy form, pages 2 and 3.)

***Testing cabinet makes weather on-the-spot for production testing of equipment . . .***

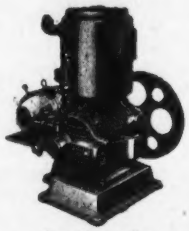
combines high temperature, low temperature, humidity with advantage of accelerated pull-down

**Uses:** Production line testing of fractional motors, relays, switches, condensers, transformers, and related equipment to meet government regulations.

**Features:** Cabinet has temperature range from minus 100°F to plus 250°F. Both high and low temperatures are regulated by controller with scale range from minus 200°F to plus 400°F, with three degree control point differential (one and one-half degrees plus and minus).




Type SS . . . for vacuum up to 5mm on tight systems, for dry or semi-wet work. Capacities 6 to 375 c.f.m.



Type RP . . . for vacuum up to 10 microns or better on dry or wet work. Capacities 17 to 845 c.f.m.

**For All Vacuum Requirements in Process or Lab**

**Up to 10 Microns or Better...**

**BEACH-RUSS ROTARY VACUUM PUMPS**

- Faster Pump Down
- Superior Mechanical Efficiency
- Longer, More Dependable Service

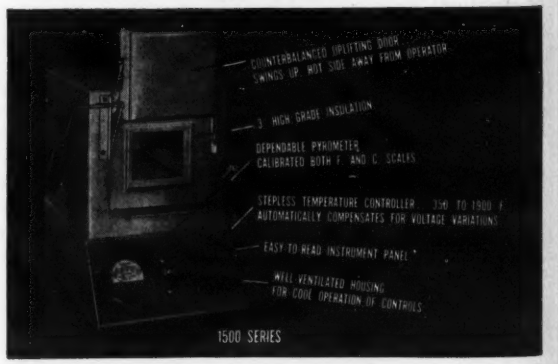
Ask us to put your name on the mailing list for "Much Ado About Nothing"... the Beach-Russ house organ that keeps its readers posted on the latest developments in vacuum processes.

BEACH-RUSS COMPANY
46 CHURCH STREET · NEW YORK 7, N. Y.

When inquiring check CP 6057 on handy form, pgs. 2-3

**FOR PRECISE RESULTS**

**TEMCO Electric Furnaces in 8 sizes to fit your specific job requirements**




Wherever you need a bench-type electric furnace—for ashing, ignitions, fusions, lab work . . . or out on the line for full-scale production—there's a specific TEMCO model to do it accurately, efficiently! Eight convenient sizes, including 1500 Series above, with chamber sizes from 4" x 4¾" x 3¾" to 9½" x 8½" x 18". High-quality construction, expertly engineered, simple to install and operate . . . manual or electronic controls. $55 to $507.50. Write for literature and name of nearest dealer.

TEMCO® ELECTRIC FURNACES

THERMO ELECTRIC MFG. CO., 476 HUFF ST., DUBUQUE, IOWA

When inquiring check CP 6058 on handy form, pgs. 2-3

Unit has accelerated pull-down — can be cycled from ambient to minus 100°F in 45 minutes or from minus 100°F to plus 200°F in 30 minutes.

Description: Test chamber is 4½ cubic feet, 20 inches high, 20 inches wide, and 20 inches deep. Unit



Test chamber is designed for production line testing of equipment to meet government requirements

size is 60 inches long, 45 inches wide, and 74 inches high. Humidity is regulated by a wet and dry bulb controller which provides 95% relative humidity at temperatures between 75°F and 95°F. Vacuum equipment can be added to simulate high altitude conditions. Multi-paned port is provided for observation of interior, and unit is equipped with moisture-proof light for interior illumination. Apertures in left side of cabinet provide for electrical cables to supply energy to equipment being tested.

(Webber Test Chamber, Model A-4½-100FHH, is a product of Webber Appliance Co., Inc., Dept. CP, 2740 Madison Ave., Indianapolis 3, Ind. . . . or for more information check CP 6059 on handy form, pages 2 and 3.)

***Direct-reading, single-pan balance eliminates all weight handling***

Two-knife-edged, one-pan analytical balance incorporates weight-handling system which reportedly allows operator to make weighings in less than 1/3 the time normally required. Balance is available in standard, semi-micro, and micro models with capacities of 200, 100, 20 g.

Eight-page bulletin describes features of balance and outlines 6-step weighing procedure. Drawings and photos illustrate features and specifications of the various models. Accessories available for use with balance are described.

Bulletin describing Fisher Gram-atic balance is issued by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. When inquiring specify CP 6060 on handy form, pages 2 and 3.





**Check Your Unit Heater Steam Traps Now**

Be prepared for winter. Equip every unit heater *now* with a Super-Silvertop Steam Trap. These traps quickly remove the cold, dead air from the core of unit heaters and permit them to fill up in much less time with hot, dry steam. Then by draining all water and condensate out of the coils, Super Silvertops enable heaters to produce maximum heat. Besides, they guard unit heaters against corrosion because of rapid air removal.

Super Silvertops save enough fuel to more than pay for themselves by winter's end!

Super Silvertops, installed straight in line or as an elbow, give you more efficient steam trapping at less cost and can be serviced without disturbing a single pipe fitting . . . and the patented guided bucket eliminates bucket damage common with other traps. The booklet "Solving Steam Trap Problems" contains complete data on selecting proper size steam traps for unit heaters. Write for your copy today.




SUPER-SILVERTOPS SAVE MONEY

THE V. D. ANDERSON COMPANY
1932 West 96th Street • Cleveland 2, Ohio
Gentlemen: Please send without obligation "Solving Steam Trap Problems."
Name_____
Company_____
Address_____
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In Canada: Bawden Industries, Ltd., Toronto

When inquiring check CP 6061 on handy form, pgs. 2-3

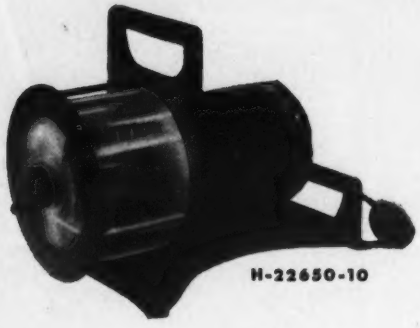
NEW

# MERCURY OXIFIER AND GOLD ADHESION FILTER

## for thorough mercury cleaning



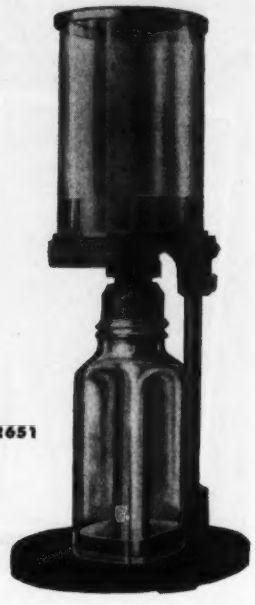
H-22650



H-22650-10



H-22651-10



H-22651

### PRINCIPLE OF THE OXIFIERS

The Oxifier acts in two ways to oxidize base metals. Paddles, developed for the work and driven by motor, (1) produce a copious spray and subject the resulting fine mercury droplets to repeated contact with air; and (2) break up oxide skins, and carry them under and through the mercury mass until oxidation is complete. After this treatment nothing oxidizable remains in the mercury.

### PRINCIPLE OF THE GOLD-ADHESION FILTERS

Action of the Filter is not that of straining through small holes—the usual understanding of "filtering"—but the principle of decanting. All foreign substances—the oxidized precipitates formed by the Oxifier, water, oil, etc.—float on mercury, leaving the central body clean. The filter draws from this clean central body and decants through a large aperture in the bottom.

Mercury does not "wet" the sides of a container, and contaminants work down between mercury and sides and would flow through the bottom aperture, except for the gold seal. This is a ring of gold alloy surrounding the aperture; and since gold is wet by mercury the adhesion between the two elements forms a positive seal through which contaminants cannot pass. Exacting tests show this gold-adhesion principle to be completely effective; removal of impurities is not partial as with chamois skin, seepage through porous members, etc. Mercury emerges in a bright, lively stream, bone-dry and entirely free of acid or oil film.

### GENERAL LABORATORY SET

**H-22650**—25-lb. Oxifier—Cleans 100 lbs. a day in 25-lb. batches. Oxidizes dissolved base metals. Height 17½"; table space 16" x 10"; weight 63 lbs.; Motor 1/12 HP, 115 V, 60 Cy. A.C.; V-belt drive; switch on motor. All exposed parts finished in green and black enamel. Complete, ready to run. Each . . . . . $180.00

**H-22651**—Type "F" Filter—Eliminates floating impurities; water, oil, oxide-dust; but NOT dissolved metals. Height 17"; table space 7" x 7"; weight 5¼ lbs.; Plastic acid-resistant reservoir holds 25 lbs.; filters in six minutes. Provided with shut-off valve. Cast iron frame finished in green and black enamel; other parts stainless steel. Each . . . . . $50.00

### SMALL SET

**H-22650-10**—5-lb. Oxifier—Cleans 20 lbs. a day in 5-lb. batches. Oxidizes dissolved base metals. Height 7"; table space 9" x 5"; weight 8 lbs.; Motor, direct-connected 1/70 HP, 115 V, 60 Cy. A.C., with line switch. Cast iron frame, finished in green and black enamel. Each . . . . . $77.50

**H-22651-10**—Type "G" Filter—Eliminates floating impurities; water, oil, oxide-dust; but NOT dissolved metals. Height 6½"; table space 3½" dia.; weight 1 lb., 2 oz.; No reservoir or shut-off valve; mercury can be poured through at rate of 5 lbs. in two minutes. Plastic and stainless steel. Each . . . . . $20.00

**HARSHAW SCIENTIFIC**
DIVISION OF THE HARSHAW CHEMICAL CO.
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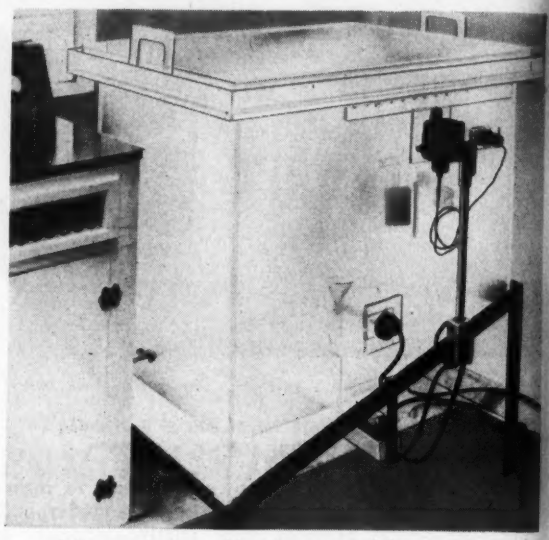
When inquiring check CP 6062 on handy form, pgs. 2-3


***5 years of development leads to salt spray cabinet that lasts indefinitely . . .***

cabinet is said to be inert to solutions and gases used in "fog-type" testing

**Uses:** For "fog-type" salt spray testing of ferrous and non-ferrous metals, or coatings of both organic and inorganic types.

**Features:** Cabinet is the result of five years of development and is said to be inert to all solutions and gases used in complete range of testing. According to manufacturer, unit will last indefinitely in continuous service. Transparency of cabinet allows observation of operations and light weight gives it portability.



Salt spray testing cabinet is connected for operation

**Description:** Singleton H-T Lucite Salt Spray Testing Cabinet is said to provide good insulation for maintenance of accurate operating temperatures. All-welded unit has atomizer which operates on any plant air system. Standard 110 volt power source is sufficient for heater.

Cabinet is 36 by 24 by 36" deep ID, with water seal trough 2" wide by 3" deep ID, and atomizer nozzle 8" from bottom. Glorod heater and two specimen supports are supplied. Range of thermostat is 60 to 100° ± 1°F. Solution reservoir is 7" deep and drain reservoir 6" deep. Unit has two fog collectors, two fog collector stands, and a steel stand for cabinet. Total weight is approx 160 lb. (Introduction by Singleton Co., Dept. CP, 10516 Western Ave., Cleveland, Ohio . . . or for more information check CP 6063 on handy form, pages 2 and 3.)

***Shows how dynamic systems will behave under a variety of conditions . . .***

multi-stage computer solves seventh-order differential equations or simulates system behavior

EASE computer (initialese for Electronic Analog Simulating Equipment) can be used in two general ways. It can solve equations; it can imitate almost any dynamic system. As an equation solver, EASE consistently produces answers to seventh-order differential equations. It can sometimes solve even higher order equations. As a rule, these equa-



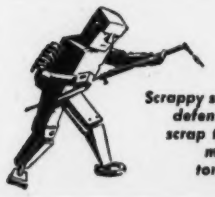

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# Engineered for extra strength

An important value you get with TUBE-TURN Welding Fittings and Flanges is extra strength . . . at no extra cost.

For example, this TUBE-TURN Welding Tee will withstand more pressure than required by standard codes . . . because it is drawn from seamless tubing to a barrel shape, and because of its generous crotch radius and thickness. Bursting pressures obtained in tests of representative fittings have averaged more than 25% higher than code requirements.

For this extra quality get in touch with your nearby TUBE TURNS' Distributor. You'll find one in every principal city.



*Scrappy says: "Aid defense—more scrap today . . . more steel tomorrow."*



Write Dept. KK-11 for free booklet on Allowable Working Pressures. Use coupon on reverse side.

Be sure you see the double "tt."



**TUBE TURNS, INC.** LOUISVILLE 1, KENTUCKY

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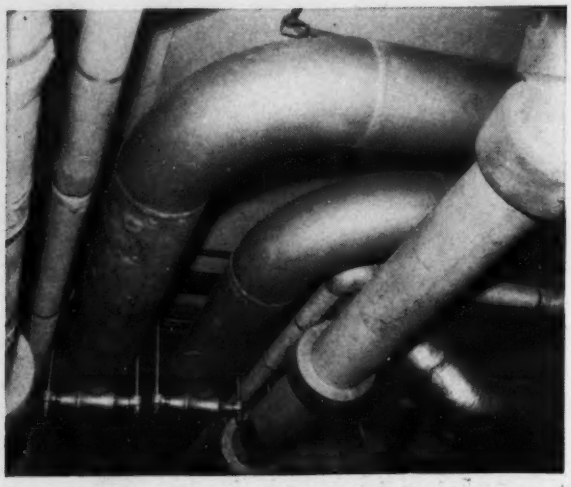
EFFICIENT PIPING FOR STOCK EXCHANGE

# Welded piping system serves New York Stock Exchange

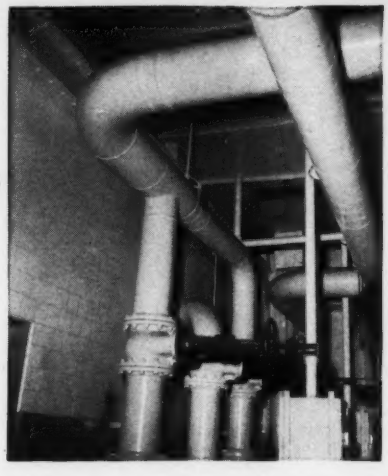


**Long the financial capital of the world, the New York Stock Exchange was one of the first commercial buildings to have controlled atmosphere. Recent additions provide efficient, modern air conditioning to keep the financial mart comfortable at all times.**

**New installations have been made with a minimum of fuss, in limited space, by use of compact welded piping systems. With TUBE-TURN Welding Fittings used to make directional changes, a permanently leakproof system is assured.**



**Use of welded piping simplified installation in cramped quarters. Welded lines can be fitted closely together, make a neat installation. Welders like to use TUBE-TURN Welding Fittings, because their consistent dimensional accuracy makes line-up easy, particularly important where space is at a premium.**



**These 10" and 14" lines carry condenser water to the building's cooling tower. Selection of TUBE-TURN Welding Fittings assures optimum flow conditions, and provides a permanently leakproof system.**

**Want Pressure Data?**

We have prepared a booklet of pressure tables covering TUBE-TURN welding fittings in all sizes, weights, and regularly manufactured materials for Power, Refrigeration, Gas, Oil, and Heating Piping. If you'd like a free copy just send the coupon.



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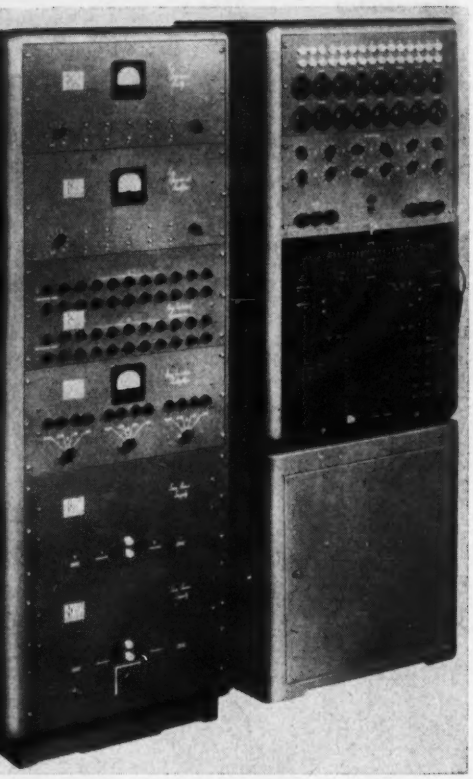

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# TUBE TURNS, INC.

**LOUISVILLE 1, KENTUCKY**



hannel amplifier, function generators and multipliers to solve equations or simulate systems

st be linear, but minor auxiliary equipment allows puter to deal with many non-linear equations. its of computer are: ten-channel amplifier, two- function generator, and function multiplier. Am- n perform summation, sign reversal, multiplica- a constant, and integration. Accuracy is about stage.

generator transforms input voltage pulses into output voltage functions. It does this by fitting ents to the curve desired. Function multiplier peration to multiplication of two dependent vari- d solution of non-linear equations with variable ts.

nulator, computer answers questions as to how a r system will function in actual operation under conditions. It solves equations concerning per- e while a variable is applied. Typical problems e: locating point at which failure will take place; g how variations in gear will affect operations; rating effect of new pressures on system, etc.

r can also be used to imitate the dynamic system on in order to test controls, associated equipment, sseblies of the system.

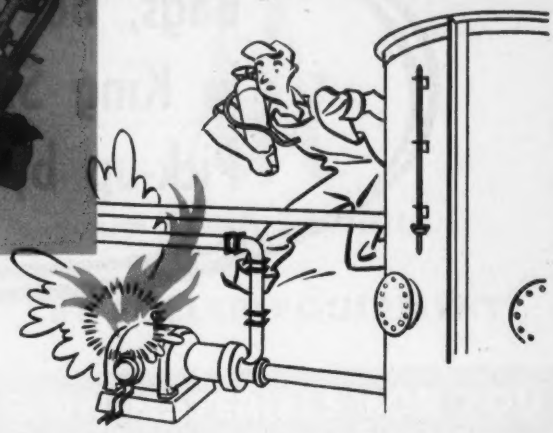
-294 explains EASE. Manufacturer is Special Div., Beckman Instruments, Inc., Dept. CP, sadena, Calif. . . . or for more information check on handy form, pages 2 and 3.)

more information on product at specify CP 6065 . . . see informa- request blank between pages 2-3.

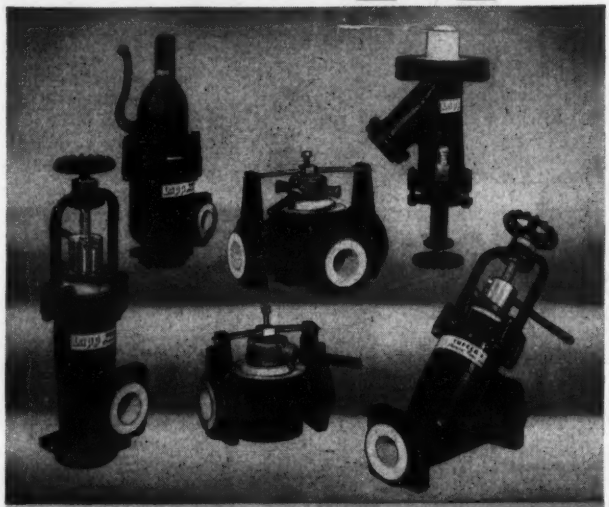

# Minor Fire or Explosion?

YOUR LINES are SAFE with





# Lapp TUFCLAD



Y-Valves and Angle Valves (in sizes to 6"), safety valves, flush valves, plug cocks, are available in Lapp solid porcelain with TUFCLAD armor. Also pipe and fittings (to 8") and a variety of special shapes.

## SOLID CHEMICAL PORCELAIN ARMORED WITH FIBERGLASS-REINFORCED PLASTIC

Now there's mechanical security to go with the chemical purity and corrosion-resistance of solid Lapp Chemical Porcelain. TUFCLAD armor is the answer—multiple layers of strong Fiberglass fabric impregnated and bonded to the body with an Epoxide resin of high strength and chemical resistance. It serves as an insulator against thermal shock—a cushion to accidental impact. And it is itself *tough* and strong, able to hold operating pressures against gross leakage even if porcelain is cracked or broken. Provide this protection to your personnel, equipment and product.

WRITE for description and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 529 Maple St., Le Roy, N. Y.

Lapp

PROCESS EQUIPMENT

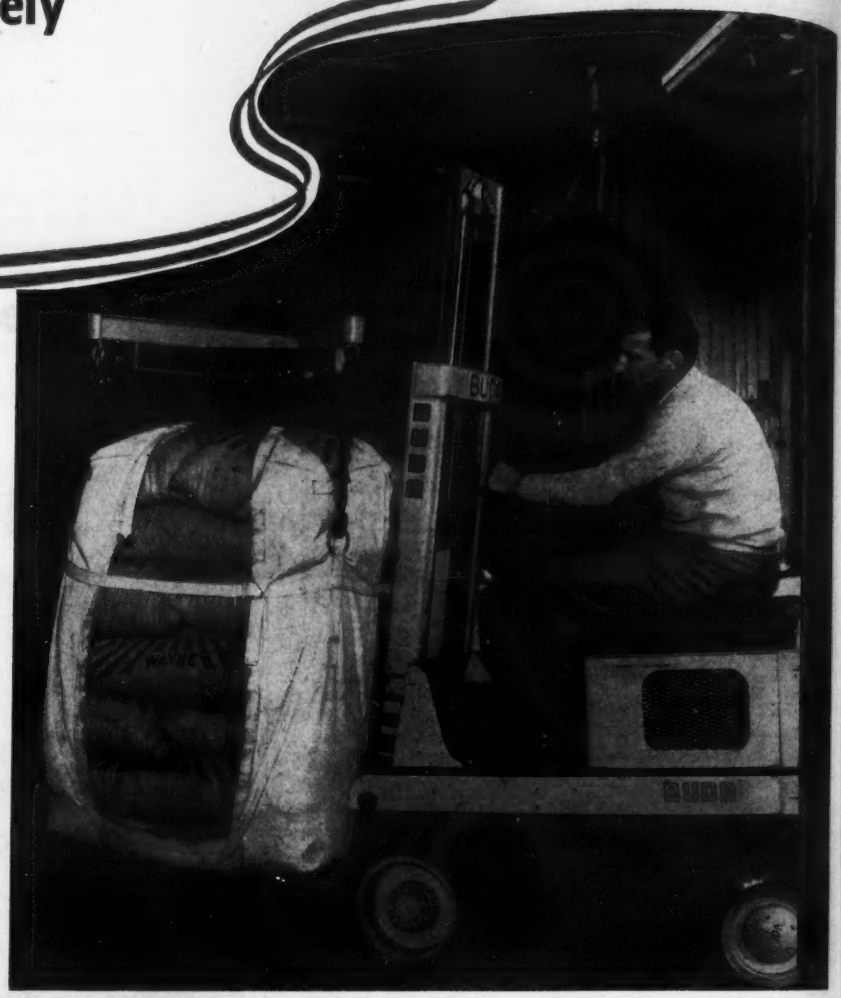
CHEMICAL PORCELAIN VALVES • PIPE • RASCHIG RINGS

PULSAFEEDER CHEMICAL PROPORTIONING PUMPS

When inquiring check CP 6066 on handy form, pgs. 2-3

# Bags, Boxes Nestle Securely in King Size Sling for Pick-up by Fork Truck

**Canvas binders also available for anchoring unit loads to pallets and skids**



Lifting binder handles load of feed sacks and is raised from above by a fork truck equipped with a special attachment

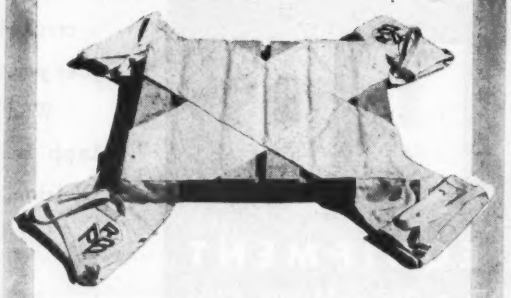
A method of quickly and easily unitizing loads of bags or cases without use of skids or pallets is provided by means of a canvas lifting binder. After load is assembled it is easily moved or loaded for shipment with regular fork truck equipped with a simple attachment.

Illustration shows how binder is used to handle bags of feed. Binder is made of 24 oz duck and weighs 18 lb. Upon piling load on binder, flaps are quickly drawn into place and tightly secured by straps and buckles. After binders are adjusted for a uniform size load, six of the buckles are eliminated and load is secured in less than a minute. For tiering at either end of shipment, the load is placed on a standard pallet.

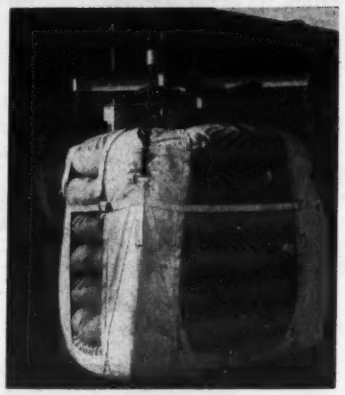
Three other types of binders that similarly unitize loads are available. The first is for use with conventional pallets or skids of any size and both secures and protects the load. To secure the binder, holes are drilled in each corner of the pallet. Wire cables, having toggles at either end, are threaded through the holes and secured to the binder by passing toggles through grommets in the canvas. If it is not practical to drill holes, cables with loops are used at each corner of the pallet. When cargo is placed on pallet, canvas is placed around it and secured with heavy canvas webbing. Canvas and webbing possess a shock absorbing flexibility which protects shipment from damage and prevents individual pieces from falling from tiered pallets. However, binder can be removed, thus permitting pallet to be tiered either with or without it.



Inserting 2 x 4's into spring steel loops of skid binder makes it ready for loading



No ties are needed with pallet binder that has canvas base; weight of load keeps it in place



Second of these three additional binders consists of a single piece of canvas. Weight of load keeps binder in place on pallet. Loads can be secured in one minute.

Slight modifications permit this binder to be used with a special truck originally designed to handle loads preassembled on paper sheets. Just as with the paper sheets, binder is grasped by jaws of clamping device and pulled onto forks of truck.

Great unit load savings can be attained by using the third of these units, the skid binder. Upon inserting 2 x 4's in the spring steel loops of the binder, loads may then be put in place. On removing load at destination, 2 x 4's are withdrawn

with binder being returned for re-use. Return shipment is no problem as they fold into a compact bundle. However, the obvious way to reship them is in unit loads secured by another binder.

(Lifting and pallet binders are available from Roger L. Toffolon, Dept. CP, Brandywine Ave. & Wylie St., Schenectady, N. Y. . . . or for more information check CP 6067 on handy form, pages 2 and 3.)

***More hp with fewer rpm enables lift truck to do more work with less wear . . .***

lighter weight, improved hydraulic steering, and greater driver vision are other features

**Uses:** For general materials handling requiring use of fork lift truck in or out of plant.

**Features:** Power plant of unit develops more horsepower and with fewer revolutions per minute, resulting in minimum wear of parts.

**Description:** Other features of Yardlift-150, pneumatic-tired fork lift truck (15,000 lb capacity) are: 1) improved hydraulic steering for easier operation, 2) fork bars are narrowed vertically to aid driver vision in

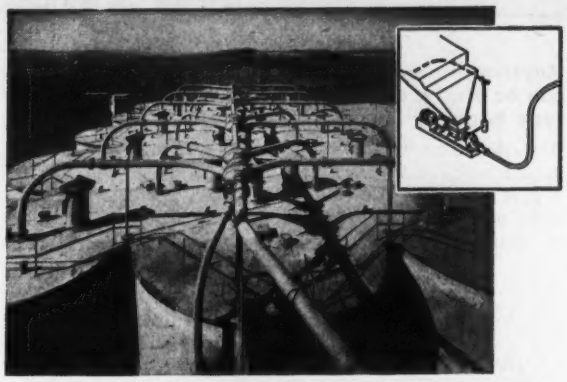


Has fewer rpm, yet gives more service

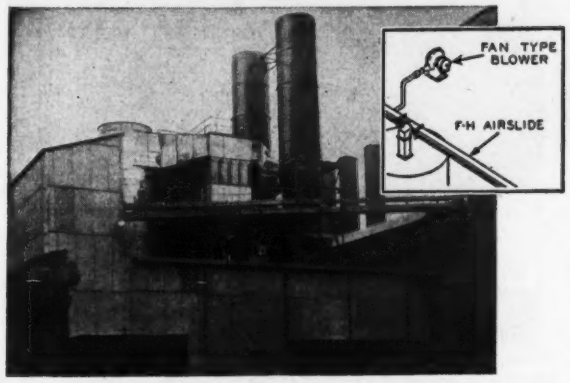
addition to increased opening by 3½" between upright channels and lift cylinders, and 3) a weight reduction of 2300 lb for increased flotation.

In the event of motor stoppage, steering can be accomplished mechanically. A separate hydraulic system is used for power steering. Pivoted-type steering axle which permits constant wheel contact during travel on uneven surfaces, is standard on this model. Uprights, made of rolled steel sections, greatly minimize possibility of twisting or spreading as a result of heavy loads. The overhead guard rack shown in the photo is extra equipment.

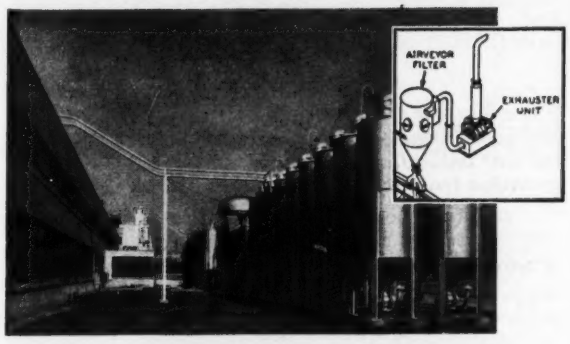
(Development of Industrial Truck Division, Clark Equipment Company, Dept. CP, Battle Creek, Mich. . . . or for more information check CP 6068 on handy form, pages 2 and 3.)



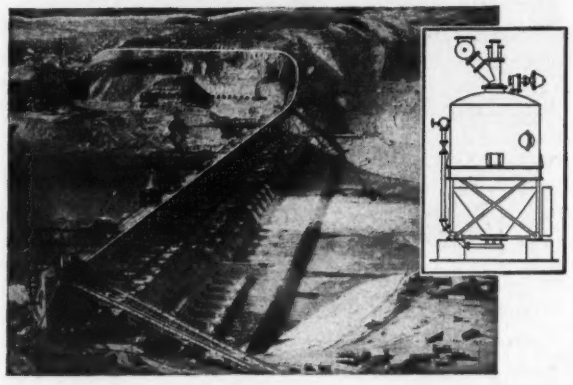
Fuller-Kinyon System




F-H Airslide




The Airveyor



Fuller-Fluxo System


**WHY NOT PUT**

# *Air*

**ON YOUR PAYROLL**

**LET FULLER EQUIPMENT**

**FLOW MATERIALS FOR YOU**

Air conveying of dry, pulverized, crushed, and granular materials to and from carriers, storage and processing points has made manual movement obsolete, inefficient and costly.

Fuller Company manufactures four basic types of pneumatic conveyors, each with its own unique features, to meet specific requirements. All Fuller systems are designed for flexible application—especially in plants where building layout and design create unusual material handling problems. Fuller systems convey anywhere—up, down, horizontally, around corners, overhead, underground.

Fuller-Kinyon Conveying System—conveys dry, pulverized materials to and from cars, ships, storage and processing points.

F-H Airslide—flows dry, fine materials, fluidized with low-pressure air, down slightly inclined channels. Dust-proof. No moving parts. No lubrication.

The Airveyor—transports dry, granular or crushed material to and from carriers, storage areas and processing points.

Fuller-Fluxo System—moves dry, pulverized material, economically over long distances.

Twenty-five years of Fuller experience in all phases of pneumatic conveying go into every engineering study (proposal drawing and estimates) which shows how you can solve your material handling problem, efficiently and economically. It will be submitted for your consideration without charge or obligation.

**FULLER COMPANY,** Catasauqua, Pennsylvania
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

**Fuller**

DRY MATERIALS CONVEYING SYSTEMS AND COOLERS ·
COMPRESSORS AND VACUUM PUMPS ·
FEEDERS AND ASSOCIATED EQUIPMENT G-75

When inquiring check CP 6069 on handy form, pgs. 2-3




## Proven Protection Against Corrosion and Abrasion

"RUBBERHIDE" is a special Goodall formula for linings processed to exterior or interior surfaces of all types of metal equipment to provide *long-lasting protection* from corrosion and abrasion. The selected rubber or synthetic compound is inseparably bonded to the metal, in any required thickness. There is virtually no limitation as to size, shape or service requirement of the metal parts or products involved. Factory processed in Trenton, N. J., or Chicago, Ill., or applied by field crews to large or permanently installed units.

*Write for illustrated Booklet, or submit details of conditions to Goodall Corrosion Control Engineers for recommendations. Your inquiry will receive prompt attention.*

PARTICIPATING IN THE MANAGEMENT AND FINANCING OF KENTUCKY SYNTHETIC RUBBER CORPORATION

**GOODALL RUBBER COMPANY**

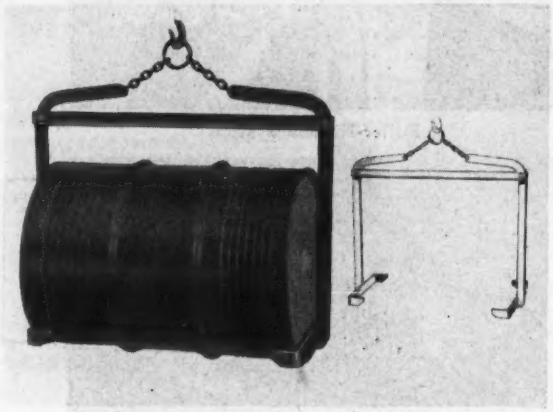
GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia • New York • Boston • Pittsburgh • Chicago • Detroit • St. Paul • Los Angeles
Est. 1870 San Francisco • Seattle • Portland • Salt Lake City • Denver • Houston • Distributors in Other Principal Cities

When inquiring check CP 6070 on handy form, pgs. 2-3


***Anything cylindrical in shape can be picked up by toggle type barrel cradle***

Any shape barrel, plywood or fiber drums, straight or bilged sides, flat or chimed ends can be picked up by toggle type barrel cradle. Unit is also satisfactory for rolls of paper, carpeting, or anything that is cylindrical in shape. Cradle is welded construction of heavy bar



For handling barrels, drums, or similar shaped objects

stock. Capacity is 1000 lb. Model shown in photograph accommodates barrel 20 to 25" in diameter and 32 to 36" in length. Special sizes can be built to meet requirements. Weight is approx. 45 lb.

(Product of Palmer-Shile Co., Dept. CP, 16016 Fullerton Ave., Detroit 27, Mich. . . . or for more information check CP 6071 on handy form, pages 2 and 3.)

***Utilize railroad hopper car design for fast unloading of powder, granules from trailer . . .***

requiring no men on trailer, petroleum catalyst streams out at 11,000 lb/hr rate

A 34,000 lb capacity trailer, patterned after a railroad hopper car, is being used for fast handling of petroleum catalyst at a large East Coast oil refinery.




Vacuum line pulls catalyst through at 11,000 lb/hr rate

Main advantage of this type of trailer, designed for hauling powders and granulated material over short distances, is that where gravity unloading is possible, no men are required on the trailer. For other materials, such as the silica-gel-alumina type catalyst being shipped,


## The Portable MORSE ROTATOR

THE NEWEST ADDITION TO 25 YEARS OF SUCCESSFUL MANUFACTURING EXPERIENCE



MODEL 500

**SAVES TIME! SAVES LABOR!**
**SAFELY ROTATES UP TO 500 LBS. AT 10, 20 OR 40 RPM**

A powerful, compact motorized unit that will cut costs of mixing, tumbling, cleaning, etc. Scientifically engineered for smooth, safe revolving. Can be loaded by ONE MAN and is easily moved. The power drive has a ¾" dia. shaft and is equipped with self-aligning bearings. Four 4" dia. Neoprene drive wheels adjustable to take from 1 to 55 gal. cylindrical containers. Wt. before crating 137 lbs. Furnished with motor and gear reduction unit. ***Write For Complete Information.***

**MORSE MANUFACTURING CO. INC.**
124 Dickerson Street Syracuse 2, N. Y.

When inquiring check CP 6072 on handy form, pgs. 2-3

## for INTER-FLOOR Handling of Bulk Materials HAMMOND Screw-Lift

If you have a problem involving horizontal, inclined or vertical movement of bulk material, Screw-Lift will give you a fast, clean, enclosed system that will save many man hours and pay for itself out of earnings.

Screw-Lift is a tried and proved tubular conveyor operating within a tube — engineered for full accessibility, with exclusive features that eliminate the possibility of clogging or degradation.

If your plant is cramped for space, Screw-Lift is just the thing, because it takes no more room than a pipe of comparable diameter. It provides for movement of material from floor to floor to bins or processing machines, or to packers. Top or bottom drives with suitable feeds and discharge spouts arranged to synchronize with your processing procedure.

Write for Screw-Lift Form M-500-2 and companion Screw-Veyor Form M-600-2 to enable us to make recommendations.



**Screw Conveyor Corporation**
659 HOFFMAN ST. HAMMOND, IND.
ENGINEERS HAMMOND PRODUCTS MANUFACTURERS

When inquiring check CP 6073 on handy form, pgs. 2-3

unloading is done at the rate of 11,000 lb/hr through a five-inch vacuum line.

(The new vehicle has been built for Parkville Trucking Co. of Baltimore by the Warner Fruehauf Trailer Co. from plans by The Davison Chemical Corp., Dept. CP, Baltimore 3, Md.)

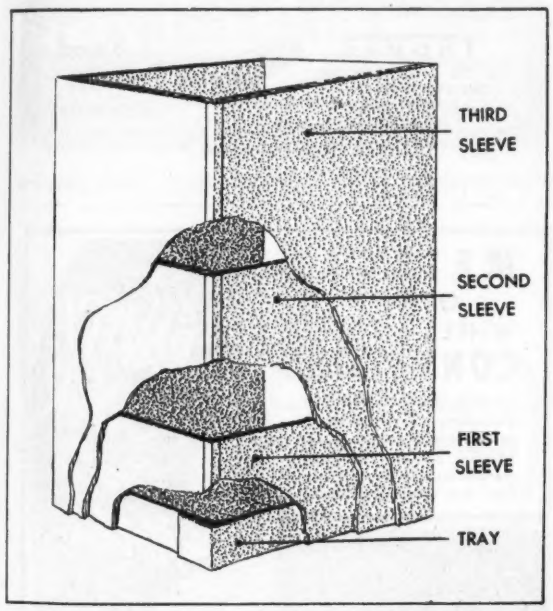
***Corrugated container will hold ton of material by reinforcing where pressure's greatest . . .***

up to 32 bales of synthetic rubber, each weighing 75 lb, are combined in compact unit load

**Uses:** For forming compact unit loads of synthetic rubber bales or similarly packed bulk materials.

**Features:** Corrugated container is reinforced where pressure from load is greatest. Box increases weight per unit load and height to reduce floor area used.

**Description:** In use, single base tray is held in position by first sleeve. When tray is filled with bales, second sleeve (higher than first) is slipped over the




Photograph shows how three sleeves are used to reinforce bottom of container, where pressure from load is greatest

side. This gives extra wall to container and space for more bales. Third sleeve is added and bales stacked inside to capacity. At bottom, where internal pressure is at maximum, container has four walls. At top, where pressure is least, single wall is provided.

Gaylord container is 100% corrugated board, and requires no reinforcing tapes, steel strapping, or wire. Ordinary blade type fork will slip under filled container, and repeated use of fork truck will not damage container. Manufacturer has used container in handling up to 32 bales of synthetic rubber, each weighing 75 pounds. User has reported savings of approximately 20 man-hours in unloading single freight car.

(Product of Gaylord Container Corp., Dept. CP, 111 N. 4th St., St. Louis 2, Mo. . . . or for more information check CP 6074 on handy form, pages 2 and 3.)




**Neff & Fry Silos for coal and ashes**

These two 18′ x 60′ coal silos and the 12′ x 20′ ash silo were erected in 1946 at the Larkin Terminal Warehouse, Buffalo, N. Y. Coal is moved by reciprocating plate feeder to a roll crusher, thence by a bucket elevator to the big silos. Withdrawal is with a screw conveyor. Ashes are hoisted by a bucket elevator and fed into the small silo by a drag chain conveyor. A gate drops loads of ashes into trucks.

We collaborated with the machinery makers in designing the system, as we do in most jobs for handling nearly a hundred kinds of flowable bulk materials.

A large part of our work is additional construction for customers. This is prima-facie evidence of user satisfaction.

*Be sure to read our folder, "Bins With the Strength of Pillars," ask for a copy.*

**THE NEFF & FRY CO. • 166 Elm St. • Camden, Ohio**

**NEFF & FRY** SUPER-CONCRETE STAVE STORAGE BINS

When inquiring check CP 6075 on handy form, pgs. 2-3

**BAKER 360° REVOLVING HEAD**
*—greatly increases FORK TRUCK utility*



By adding a fourth motion (1 travel, 2 lift, 3 tilt and 4 ROTATION) to a Baker Fork Truck, this attachment can greatly increase the truck's utility on many applications in metal-working, chemical or food processing plants, foundries, paper mills, etc. The most common use is for dumping skid boxes—but rotating heads may be equipped with devices such as clamps for handling drums, paper rolls and other cylindrical objects. Operation is hydraulic, with a single control lever starting, stopping, selecting direction and speed of rotation.



*A large electrical manufacturer saves $10,000 per year on scrap disposal operations with this Baker Revolving Head.*

*Write for Bulletin 1350-7*

**THE BAKER-RAULANG COMPANY**
1208 WEST 80th STREET, CLEVELAND, OHIO

**Baker INDUSTRIAL TRUCKS**

When inquiring check CP 6077 on handy form, pgs. 2-3

**get "HS" buckets for longer life**

**at no extra cost**



**The next time you buy buckets, be sure you get this advanced design by LINK-BELT**

LINK-BELT "HS" Buckets give you the ultimate in centrifugal discharge bucket elevator operation . . . at either high speeds or nominal speeds. High bucket ends minimize spillage. Low front lip provides efficient pick-up.

And "HS" Buckets last longer: Bucket ends, same gauge as body, are folded over body for added strength and rigidity. Back of bucket is crimped for end fold, giving smooth, flat back surface contact. Smooth interior permits quick, clean pick-up and discharge.

The complete Link-Belt line also includes steel, malleable and Promal buckets of various designs, including Salem and continuous types.

12,385-R

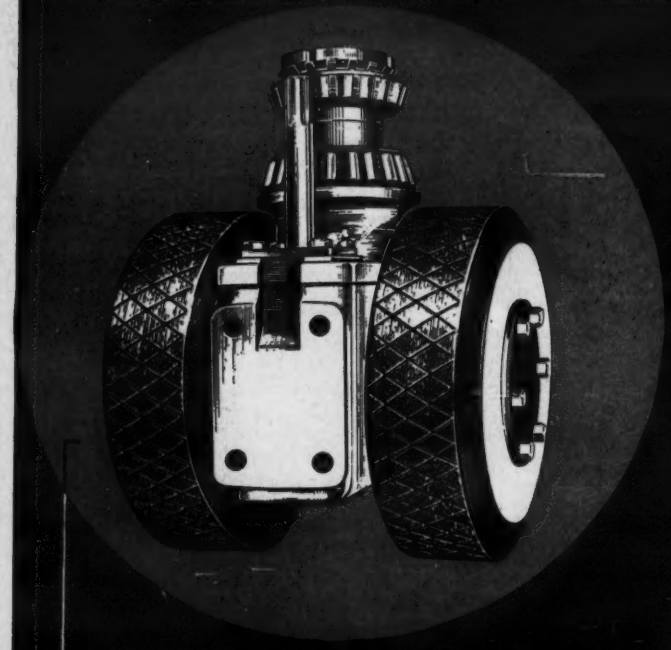
**LINK-BELT**

**"HS" ELEVATOR BUCKETS**

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, factory branch stores and distributors in principal cities.

When inquiring check CP 6076 on handy form, pgs. 2-3

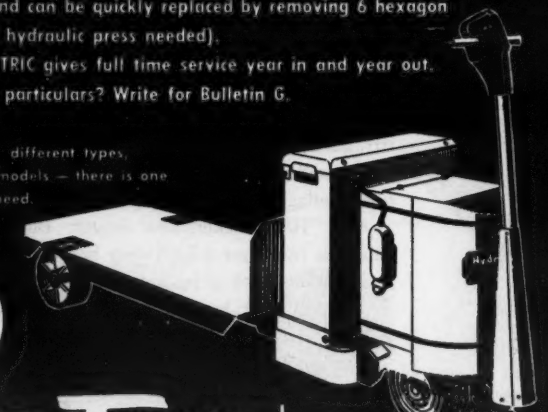
**HydroLectric LIFT TRUCKS**



# utmost stability

Only the Stuebing designed HYDROLECTRIC with the exclusive Dyna-Dual Power Unit gives you twin front wheel drive for the greatest stability, ease and safety in moving the heaviest loads. True differential gear drive with sealed in lubricant permits 50% easier steering (and less "scrubbing" of tires) — Vertical motor connects to worm, which is positioned firmly in two sealed Timken roller bearings to give maximum power efficiency. Wide spread front wheels with solid rubber non-skid tires give more traction and can be quickly replaced by removing 6 hexagon studs (no hydraulic press needed).
HYDROLECTRIC gives full time service year in and year out. Want full particulars? Write for Bulletin G.

Over 1071 different types, sizes and models — there is one for every need.



LIFT TRUCKS INC. CINCINNATI

**LIFT TRUCKS** INCORPORATED | 2423-31 SPRING GROVE AVE. CINCINNATI 14, OHIO

When inquiring check CP 6078 on handy form, pgs. 2-3



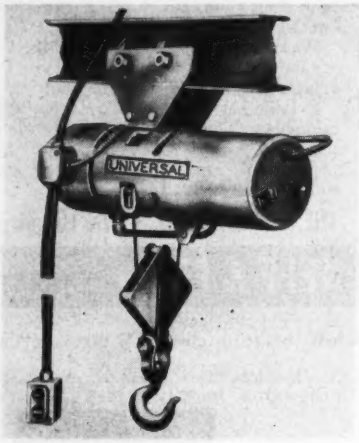

***Use of heliocentric gear packs more power in hoist . . .***

compact electric unit is supplied in 1, 2, 5-ton capacity

**Uses:** For hoisting or lowering materials where compactness and considerable strength of hoisting machine is required.

**Features:** Heliocentric gear is incorporated in design of hoist to give more power, added life to unit.

**Description:** Electric hoist, in 1, 2, and 5 ton capacity, has center drum with hollow shaft through which passes high-speed drive shaft




Combines compactness with strength

from high-torque electric motor to input shaft of the gear. Mounted on input shaft are two eccentrics which operate gear mechanism. Electric brake is on outer end of gear box.

All rotating elements are laid in heavy-duty, anti-friction bearings; all gears are hardened and ground.

(Development of Universal Gear Corporation, Dept. CP, 19th and Martindale Ave., Indianapolis 7, Ind. . . . or for more information check CP 6079 on handy form, pages 2 and 3.)

***Special bearings add life to portable conveyor . . .***

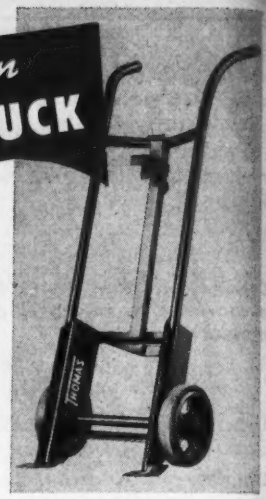
cross-braced frame gives 10′ section 500 lb capacity

**Uses:** For conveying of materials.

**Features:** Special machined bearings for rollers reported to give superior service over stamped bearings usually associated with lightweight roller conveyors.

**Description:** Frame of series No. 2520 roller gravity conveyor can


*One-Man* **DRUM TRUCK**




**Makes Loading And Unloading Of Drums Up To 1000 Pounds Automatic**

Handling of drums and barrels becomes a cinch for one man with this Thomas Safety Drum Truck. Trucker never touches barrel—loading and unloading is automatic. Sliding 2-in-1 hook fits all wooden and metal barrels, cradles drum securely so it can't roll off. Available with chemical resistant tires. Order one on trial basis.

The No. 90 Thomas Drum & Barrel Truck shown above has a capacity of 1000 lbs., weighs 80 lbs.




**THOMAS** TRUCK & CASTER CO. 279 Mississippi River Kookuk, Iowa

*Send* for free literature

When inquiring check CP 6080 on handy form, pgs. 2-3

**METZGAR** GRAVITY WHEEL & ROLLER **CONVEYORS**

Saves up to 70% time in loading, unloading, warehouse handling and production line flow of work at no cost for power. Portable or permanent installation. Lubricated for life. Ball Bearing throughout.

GRAVITY POWER *Costs Nothing*



Standard 11½"; 15"; 18" widths . . . 5'; 10' lengths. Curves 5'; 8'; 12', or to order. Strong ribbed rails. Ask for Folder No. 1251

**METZGAR CO.** METZGAR CONVEYORS

MFGRS. OF WHEEL & ROLLER GRAVITY & LIVE ROLLER CONVEYORS • POWER BELT CONVEYORS • SWITCHES • ACCESSORIES • REEL DOLLIES & END-WOOD WHEELS.

449 Douglas, N.W.

GRAND RAPIDS 4, MICH.

When inquiring check CP 6081 on handy form, pgs. 2-3

# SAVE TIME... STORAGE SPACE ...AND AVOID SPILLAGE

with TELLEVEL AUTOMATIC BIN-LEVEL CONTROL



Let TELLEVELS watch your bin-level for you . . . Avoid empty or overflowing storage bins.

Mount a TELLEVEL near the top and another near the bottom of your storage bin . . As the material-level falls or rises, the light pendant is pushed aside . . . Automatically *starts or stops* conveyor, elevator or pump . . . Can be furnished for bulk materials or liquids.

*Check possible uses. Write now for Bulletin No. 440.*

STEPHENS-ADAMSON MFG. CO.

Tellevel-Bin Level Controls · Car Loaders · Car Pullers · Saco Speed Reducers · Winches · SealMaster Ball Bearings

11 RIDGEWAY AVE., AURORA, ILLINOIS

When inquiring check CP 6082 on handy form, pgs. 2-3






This illustrated folder describes the complete line of Ballymore ladders that are saving time and money and increasing capacity of storage space in business and industry. Send for your free copy today.

BALLYMORE COMPANY
WAYNE 10, PENNSYLVANIA

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

When inquiring check CP 6083 on handy form, pgs. 2-3


support 500 lb on 10′ section. Individual roller capacity is 125 lb. Conveyor frame is composed of 2½" channel and 12 gage material secured by four cross braces of 1½ x 1½ x 3/16" angle iron.

Rollers are 2" diam, 12 gage, with formed ends and receive a machine bearing. Conveyor is available in 12, 16, 18, 20 and 28" widths with rollers on multiples of 3 or 4" centers.

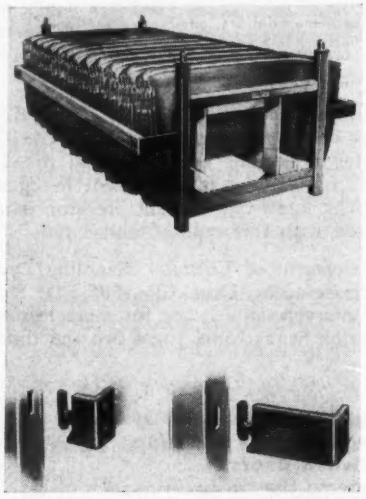
(Development of Mechanical Handling Systems, Inc., Dept. CP, 4601 Nancy Ave., Detroit 12, Mich. . . . or for more information check CP 6084 on handy form, pages 2 & 3.)

***Locking of side rails in storage racks simplified . . .***

bayonet fittings require no bolts, speed assembly for stacking

Safer movement and stacking of bulky and overhanging loads in production, storage, and shipping, along with better load balance, are features of manufacturer's standard portable stacking-type stock racks.

Both flush and extended type rails, of hard wood with formed metal fittings, are equipped with bayonet cut-



Bayonet design means faster handling

outs in the uprights for attaching side rails. The attaching mechanism involves no bolts or loose parts and rails can be locked in position or disengaged for loading and unloading by simply lifting and tipping.

(Development of Equipment Manufacturing, Inc., Dept. CP, 21550 Hoover Rd., Detroit 5, Mich. . . . or for more information check CP 6085 on handy form, pages 2 and 3.)


# Robinson Air-Activated Conveyor

*The* ***Low-volume*** *Air Conveyor*



Heart of the Robinson Air-Activated Conveyor System . . . the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.

**Averages 1 Cubic Foot of Air per Pound of Materials Handled**

Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

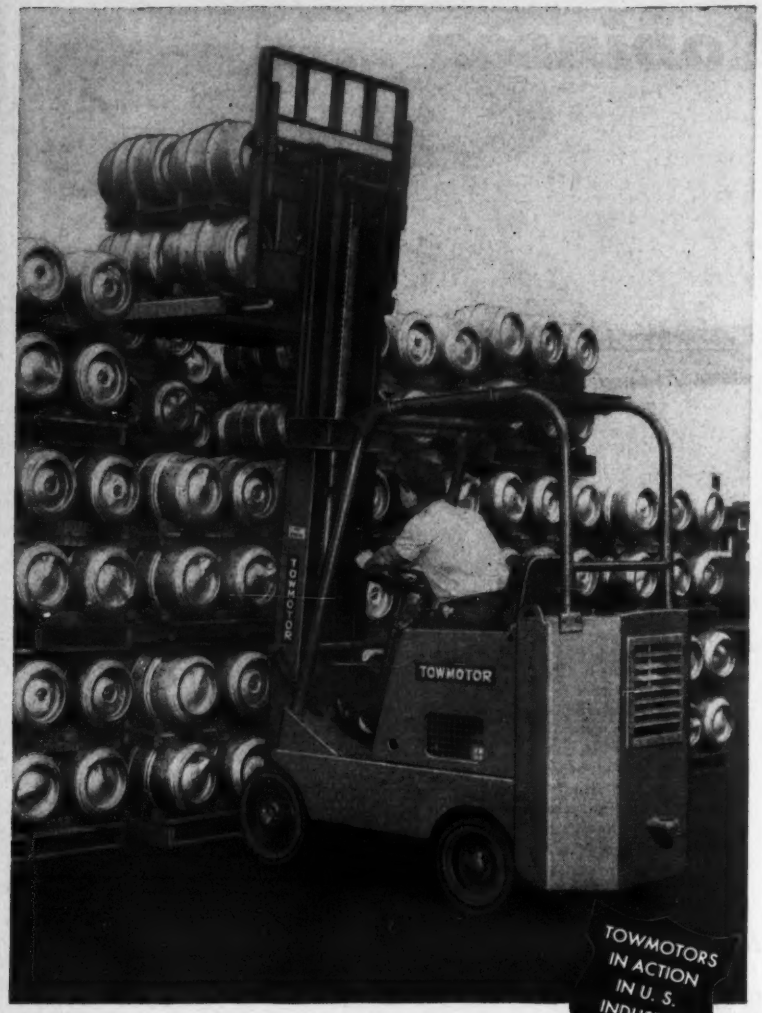
ROBINSON Air-Activated CONVEYOR SYSTEMS

A Division of Morse Boulger Destructor Co.

211-V EAST 42nd ST. • NEW YORK 17, N. Y.

*Representatives in Principal Cities*

When inquiring check CP 6086 on handy form, pgs. 2-3




Stacking double-tier pallets of keg beer at The F. & M. Schaefer Brewing Co., Brooklyn

**Lay it on the line...**

multi-ton, multi-tier, palletized or otherwise . . . place load after load in exact formation with *untiring* Towmotor fork lift trucks. Towmotor teams up with 25 specialized attachments to speed "pushbutton" handling of *all* types of material. For your copy of "Man Hour Thieves," packed with timely production tips, and name of your nearest Towmotor Representative write Towmotor Corporation, Div. 23, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG ®

**FORK LIFT TRUCKS and TRACTORS**
SINCE 1919
RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

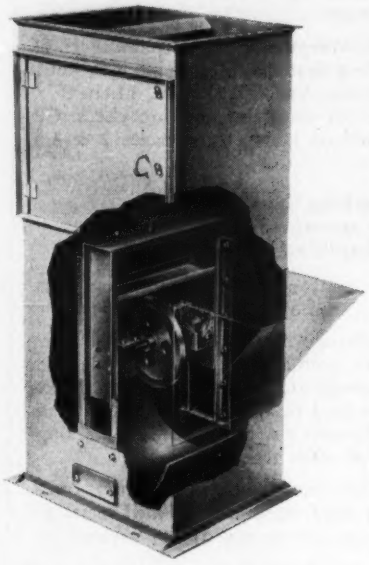
When inquiring check CP 6087 on handy form, pgs. 2-3


***One installation takes care of take-up worries and water leakage of bucket elevators . . .***

. self-adjusting mechanism requires no lubrication or maintenance, remains water-tight

**Uses:** For providing automatic take-up of bucket elevators.

**Features:** Full floating, self-adjusting take-up mechanism maintains proper chain tension, reported to give years of material-tight, water-tight service, with no maintenance other than removal of elevator chain links to compensate for wear, stretch or elongation.



Keeps material dry, needs no attention

**Description:** Construction of bucket elevator boot includes double sealed roller bearings held in dust-tight steel box packed with oil waste. Where take-up shaft enters box, an automotive type seal is used around shaft to prevent material from entering. Smooth rim traction wheel used for take-up will not permit bucket to be forced off chain.

Clean-out door is gasketed. Removable, hinged dust-tight doors permit easy removal or installation of unit. Water-tight boot keeps material dry even if "several feet" of water may be present in bucket elevator pit. Present screw-type bucket elevator takeups can be replaced with this type of unit.

Development of Chemical Handling Division, Beaumont Birch Company, Dept. CP, 1505 Race Street, Philadelphia 2, Pennsylvania. . . . or for more information check CP 6088 on handy form, pages two and three.)

***Electric eye conveyor system simplifies bulk handling between floors . . .***

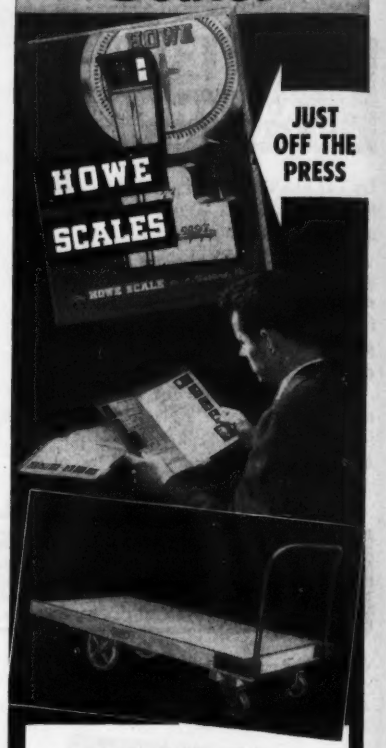
automatic unit will carry large quantities of material in either or both directions

**Uses:** For frequently moving relatively large quantities of material between floors.

**Features:** Installation at Continental Can's Baltimore plant handles bundles of tinplate. In operation, system has eliminated 140' fork truck haul, released fork truck and elevator for other duties, relieved plant traffic conditions, and cut work hours.

**Description:** Lowerator-conveyor system is composed of three major units: 1) lowerator, 2) feeder conveyor, 3) take-off conveyor. They are automatically


HOWE Scales



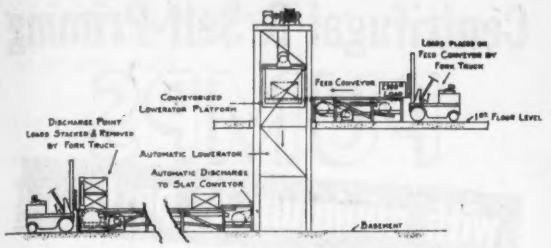

**Let Us Send You This New Condensed Catalog**

The *NEW* Howe Scale Condensed Catalog showing a complete line of industrial scales and hand trucks is yours for the asking. Includes data on the new Howe Weightograph and the new Howe Tape-Drive Dial Scale line for improved weighing operations. Send for your copy today.

The HOWE SCALE Co.
RUTLAND VERMONT

Dept. CP 11, Rutland, Vermont
Please send me:
HOWE CONDENSED SCALE CATALOG NO. 11 ☐
HOWE HAND TRUCK CATALOG NO. 15-B ☐
Name _____
Title _____
Company _____
Address _____
City _____ State _____

When inquiring check CP 6089 on handy form, pgs. 2-3




Schematic view of lowerator-conveyor system

interlocked and controlled by electric eyes and limit switches. When feeder conveyor receives load, it delivers it to lowerator which descends and delivers load to take-off conveyor from which it can be removed by fork truck.

One element of system will not discharge its load until the next is ready to receive it. Lowerator and conveyors are constructed to fit given space requirements and to handle specific loads.

(Product of Gifford-Wood Co., Dept. CP, Hudson, N. Y. . . . or for more information check CP 6090 on handy form, pages 2 and 3.)

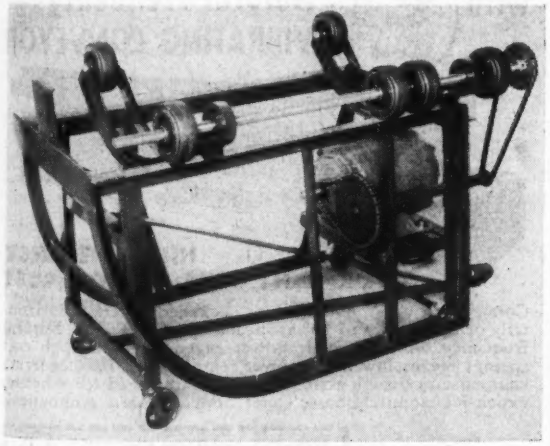
***Portable rotator mixes contents of 30-55 gal drums and supports 500 lb . . .***

idler wheels of unit are strengthened by use of second horizontal steel brace

**Uses:** For agitating or mixing drum contents.

**Features:** Portable machanism can handle drum contents up to 500 lb, accommodates 30 to 50 gal drums.

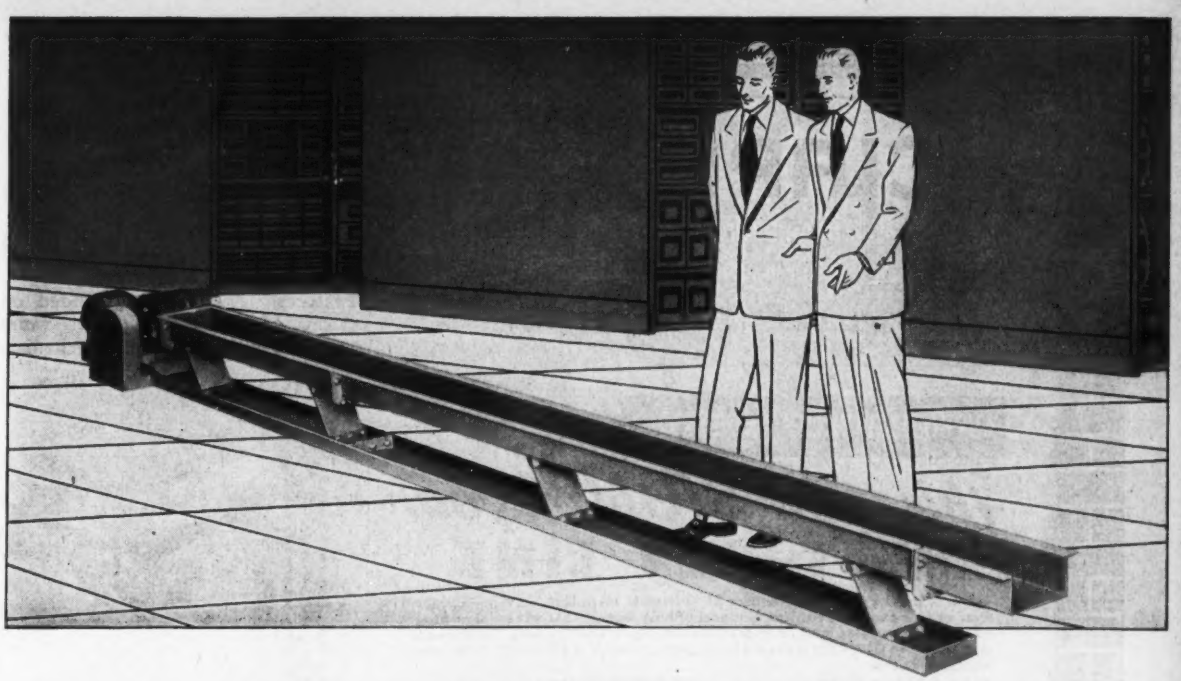
**Description:** Model 200 Rotator has been strengthened by a second horizontal steel brace to give additional support to the idler wheels. Drive motor has been positioned to allow idler reduction sprockets to be



Portable mixer handles drum contents up to 500 lb

located inside the framework of the unit. Position of motor and addition of a reinforcing brace in this model provide greater stability to the idler jackshaft.

(Development of the Morse Manufacturing Co., Dept. CP, Syracuse, N. Y. . . . or for more information check CP 6091 on handy form, pages 2 and 3.)

# Now you can buy FLEXMOUNT Oscillating Conveyors "right off the shelf"

**Stock sections make FLEXMOUNT Positive-Action Conveyors easy to order...easy to install**

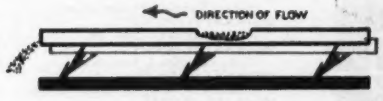
Yes, you can now get FLEXMOUNT Oscillating Conveyors for immediate delivery from stock. There's no more waiting for special engineering—stock sections are easily built up to any length desired.

This off-the-shelf service applies to 8, 12 and 18 in. trough widths. For greater capacities, Link-Belt has heavy-duty designs. All offer lower handling costs . . . make many difficult conveying jobs practical for the first time.

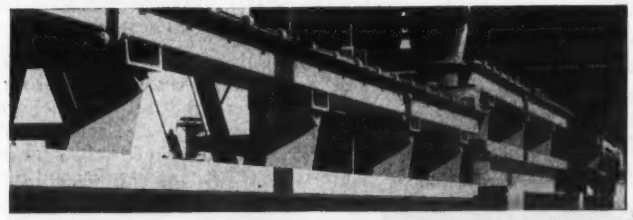
Link-Belt test units and laboratory facilities are available for your use. Our engineers will be glad to demonstrate how FLEXMOUNT Oscillating Conveyors can serve your requirements.

Versatile, low-cost FLEXMOUNT Conveyors are easily kept clean, can be made dust-tight if desired. For all the facts, write for your copy of new Book 2478.

**How Positive Action moves material...**




Positive-action, constant-stroke eccentric drive provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Natural spring action of resilient legs reduces power requirements to a minimum.



Note the compactness of this dust-proof enclosed FLEXMOUNT Oscillating Conveyor. All-metal trough is self-clearing.

LINK-BELT

12.900

FLEXMOUNT OSCILLATING CONVEYORS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

When inquiring check CP 6092 on handy form, pgs. 2-3

CLARK
MATERIALS HANDLING EQUIPMENT
AUTHORIZED SALES AND SERVICE

*This is the SIGN of your*
**BEST-BUY LINE**

**—and it marks your BEST source of Materials Handling Service—Service that encompasses Technical Counsel, Plant Surveys, Operator Training and Engineering as well as expert Maintenance and Repairs. Look with confidence to CLARK's nation wide organization of Authorized Sales and Service Dealers.**

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**In the Yellow Pages of your phone book, you will find your nearby CLARK dealer listed under "Trucks—Industrial"**

INDUSTRIAL TRUCK DIVISION
**CLARK EQUIPMENT COMPANY**
BATTLE CREEK, MICHIGAN

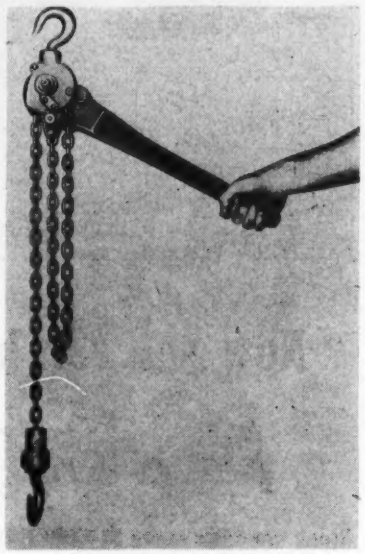
When inquiring check CP 6093 on handy form, pgs. 2-3


***Loads are safe with ratchet-lever hoist . . .***

device supports 3000 lb load, handle works in any position

**Uses:** For hoisting loads up to 3000 lb.

**Features:** Load is suspended on ratchet and pawl at all times, won't slip, nor will the holding mechanism



Handle operates in any position

freeze. Handle operates in any position allowing unit to be used in cramped quarters or where there is little head room. Handle can be operated with either partial or full strokes.

**Description:** Design of the Model R coil-chain ratchet-lever hoist, available in 1500 and 3000 lb capacities, eliminates necessity of a friction brake.

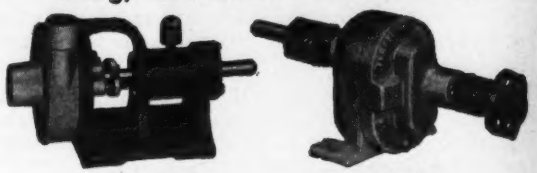
Use of coil instead of roller chain permits chain to swing or wrap easily in any direction. When not under load, chain may be pulled freely through hoist head for quick adjustment. Safety stops prevent spinning of the handle.

Having only a few parts, hoist can be disassembled with a screwdriver, manufacturer reports. Models have been factory-tested at 100 per cent overload. An additional safety measure is that the handle will bend under maximum overload conditions.

(Development of the Coffing Hoist Company, Dept. CP, 800 Walter St., Danville, Ill. . . . or for more information check CP 6094 on handy form, pages 2 and 3.)


**ERTEL STAINLESS STEEL**
**Centrifugal & Self-Priming**
**PUMPS**
**with minimum of parts...**

**Meet requirements for handling corrosive liquids in the *Drug, Chemical and Food field.***



MODEL SCP
**CENTRIFUGAL**

MODEL ESP
**SELF-PRIMING**

*Write for fully illustrated Literature*

**ERTEL ENGINEERING**
CORPORATION
**KINGSTON 3, NEW YORK**
Branch Office & Showroom Located in New York City
OUR REPRESENTATIVES IN THOMAS REGISTER
COMPLETE LINE OF
*Liquid Handling Equipment*
ERTEL

When inquiring check CP 6095 on handy form, pgs. 2-3

CONVEY—HEAT—
COOL—SCALP—DRY
with S-A "Natural Frequency"
VIBRATING CONVEYOR



**HIGH EFFICIENCY**
**FOR MANY JOBS, AT LOW COST**

**Conveyor trough moves bulk or packaged materials horizontally or up inclines to 10° at speeds up to 70 F.P.M. Natural frequency vibration with power regenerated through coil springs means low input power requirement. Balance frame compensates trough action and eliminates need for a heavy, expensive mounting base. Quiet...dependable...economical.**

WRITE FOR BULLETIN 950
Containing full application data

**STEPHENS-ADAMSON MFG. CO.** S-A
**Standard Products Division**
**11 Ridgeway Ave., Aurora, Ill.**
Please send me Bulletin 950 on S. A. Vibrating Conveyors.
*Name* .....
*Company* .....
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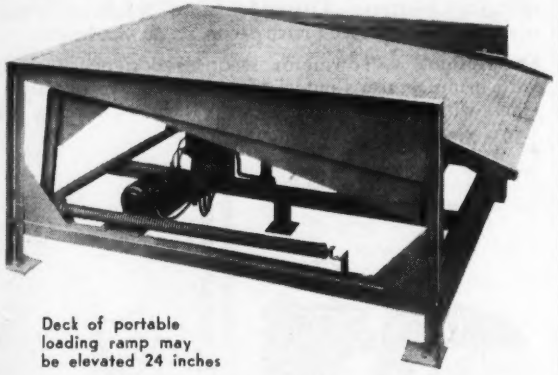
When inquiring check CP 6096 on handy form, pgs. 2-3

***One man at push-button replaces labor of ten at loading dock . . .***

portable loading ramp has 24" deck travel so that trucks of any bed height are easily loaded

**Uses:** As portable loading ramp to speed loading and unloading between truck and warehouse dock. It is strong enough to support fork lift trucks driven onto ramp during operations.

**Features:** Electric ramp may be moved to any location and installed in five minutes. Ramp has enabled



Deck of portable loading ramp may be elevated 24 inches

one man at push-button to perform work of ten in handling bulk materials. Hydraulically operated deck has 24" travel so that it can be adjusted to any bed height in few seconds.

**Description:** Portable Loading Ramp is powered by ½ hp drip-proof motor, which may be connected to any 110 v outlet. Ramp may be either manually or hydraulically operated. Latter model uses ⅜" standard Viking 250 lb pressure hydraulic pump. Capacity is 20,000 lb and ramp is counter balanced by tension-type coil springs to eliminate additional load on truck beds. Although not required for recessed installations, leg supports are furnished with "in-front-of-deck" ramps.

Ramp has adjustable throw plate which can be easily raised or lowered so that use inside buildings will not interfere with doors. Throw plate as well as the deck can be locked in horizontal position during loading.

(Product of John B. Illo Engineering Co., Dept. CP, 2414 E. 57th St., Los Angeles 58, Calif. . . . or for more information check CP 6097 on handy form, pages 2 and 3.)

***Deals with selection and use of engine anti-freezes***

Sixteen-page report provides consumers with practical advice and information on engine cooling system anti-freezes and corrosion inhibitors. Other cooling system service products are also discussed.

Bulletin was prepared by committee of ASTM on engine anti-freezes. General introductory statement is followed by sections dealing with classification of types, installation and servicing, testing, mixing of different types, re-use of solutions, and stop-leak products.

"Selection and Use of Engine Anti-freezes" may be obtained by remitting 40 cents to American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

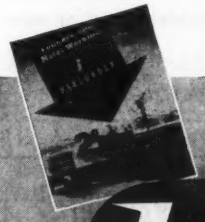

# Laborer. . . 1952 MODEL



No matter how good a man may be with a hand shovel and wheelbarrow, his production is many times greater as a "PAYLOADER" pilot. What's more — both he and his boss are happier because they both make more money.

In hundreds of fertilizer and chemical plants "PAYLOADERS" have taken over unpleasant, laborious material-moving chores — saving time, cutting costs and increasing production. They scoop up, carry, dump, spread and stockpile all kinds of materials such as fertilizer, chemicals, coal, coke and ashes . . . lift, push . . . spot and unload box cars and do many other cost-cutting jobs . . . release manpower for more productive work.

Every "PAYLOADER" is a complete Hough-built tractor-shovel designed specifically for tractor-shovel work, with multiple reverse speeds, large pneumatic tires and other features that insure fast, low-cost performance over floors or unpaved ground, up and down ramps, through congested areas. The "PAYLOADER" is sold by a world-wide Distributor organization with complete service facilities and seven sizes are available from 12 cu. ft. to 1½ cu. yd. bucket capacity. The Frank G. Hough Co., 744 Sunnyside Ave., Libertyville, Illinois.



**JOB STUDIES** are available without cost or obligation. Each one is a detailed, authorized word-and-picture report of "PAYLOADER" performance in a specific plant. A request on your letterhead is all that's necessary.

**PAYLOADER®**


When inquiring check CP 6098 on handy form, pgs. 2-3

# New MIKRO AIR CONVEYING SYSTEM

Ventilates and Cools as it Carries Material to the MIKRO-COLLECTOR*




Diagram showing installation for conveying material from dryer (or other equipment) to drum packers, cooling it during conveying from 220°F. to 120°F., exhausting two barrel packer hoods with face velocity of not less than 200 ft. per min. Total air used for both conveying and hood venting approximately same as needed for hood venting alone.

- *Permits use of ventilated air from packaging hoods to be used for conveying material*
- *Reduces required size of dust collecting unit as much as 50%*
- *Conveys material from any dust source (dryer, pulverizer, blender, tank, vat, etc.)*
- *Cools the conveyed material without mechanical refrigeration*
- *Spans distances up to 200 feet*
- *Will by-pass any obstacle in the form of existing machinery or equipment*

These and other advantages make the MIKRO Air Conveying System an ideal low-pressure, low-cost method of conveying material from any dust source. Its complete flexibility helps solve plant layout problems without costly flow sheet revisions.

This dust-tight installation conveys up to 800 grains of dust per cubic foot of air . . . Makes possible the return of filtered air to processing area, thus reducing loss of heated or conditioned air . . . Assures freedom from infestation and metallic contamination . . . Easily cleaned . . . Eliminates booster fan, thus preventing change in particle sizing.

The MIKRO Air Conveying System is more economical to install, operate and maintain than a conventional mechanical system. Even greater saving is effected when stainless steel or non-ferrous construction is required.

*Patents applied for by H. J. Hersey, Jr. and Pulverizing Machinery Company

SEND FOR new MIKRO AIR CONVEYOR Bulletin

Booths 300-302 — National Power Show — Grand Central Palace — December 1-6, 1952

**PULVERIZING MACHINERY COMPANY**
60 Chatham Road Summit, New Jersey

PRESERVE OUR HERITAGE: FAITH, FREEDOM AND INCENTIVE

MIKRO-COLLECTOR (100 PER CENT)
Reg. U. S. Pat. Off.
By the makers of
MIKRO-PULVERIZERS and MIKRO-ATOMIZERS

When inquiring check CP 6099 on handy form, pgs. 2-3

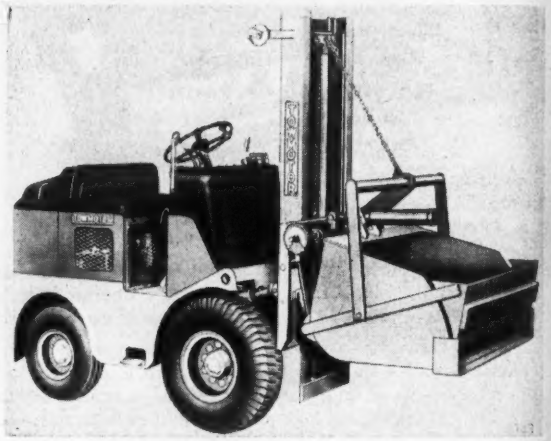

***Bulk loads scooped up in a jiffy, transported and dumped with little effort . . .***

shovel-type attachment on fork lift truck is extremely maneuverable in tight quarters

**Uses:** For picking up, transporting, and dumping bulk loads. Typical uses include: loading cars, trucks and hoppers; dumping materials into bagging machines, mixers, charging boxes and skip hoists; handling bulk scrap in storage and shipping operations; delivering scrap for re-processing.

**Features:** Simple operation, extremely maneuverable in tight quarters. Lifting-lowering action makes it possible to dump loads from scoop at various heights.

**Description:** Towmotor scoop is designed for use with manufacturer's model of lift trucks. In operation, truck with attachment moves forward — forcing the



Makes easy work in scooping bulk loads

scoop into the pile of material. Load is then lifted by truck's regular hydraulic elevating mechanism. Fitted with a pneumatic snubber to reduce shocks, scoop trips easily for gravity dumping.

A slice bar (optional) prevents full loads from spilling and operates entirely automatically. It remains open 18" when scoop is on the floor ready to pick up a load. It begins to close as the scoop is raised, closing completely when bottom of the scoop reaches a height of 9" above the floor.

(Development of Towmotor Corp., Dept. CP, 1226 E. 152nd St., Cleveland 10, Ohio . . . or for more information check CP 6100 on handy form, pages 2 and 3.)

***Heavy loads, high speeds, long trips are among features of lift truck line . . .***

gas-powered three and five-ton models handle skids and other equipment, have 4-wheel steering

**Uses:** As a low-lift transport medium for handling all types of skids and skid boxes, special racks, and other load supporting devices.

**Features:** Maximum maneuverability is provided by 3- and 5-ton models through four-wheel steering.

**Description:** Low-lift platform trucks are end control, stand-up types with four cylinder engine driving a

--this Picture in your Plant?



OLD METHOD OF HANDLING BARRELS AND DRUMS. Trucker with helpers and hard work. Eliminate this by using the—

SABIN BARREL TRUCK

One-Man Labor Saving Way



Here is your opportunity to reduce costs. One Man with a Sabin Type "L-3" Truck easily picks up containers up to 800 pounds, by simply running truck up to container, hooking on at top and pulling back on handle. Exclusive Third Wheel Feature insures better load balance and added safety during transfer.

Write for Bulletin No. 48-A

The Sabin Machine Co.

6534 Carnegie Avenue

CLEVELAND 3, OHIO

MANUFACTURERS OF ONE MAN TRUCKS FOR DRUMS, BARRELS, BOXES, CARBOYS AND MANY OTHER PURPOSES.

When inquiring check CP 6101 on handy form, pgs. 2-3

PUMP HIGHLY CORROSIVE FLUIDS SAFELY

NEW POLYETHELENE PUMPS

WITH NATURAL RUBBER, GUM, NEOPRENE, BUNA, HYCAR

"NO STUFFING BOXES"

"flex-i-liners"




ESPECIALLY DESIGNED TO HANDLE HCl, HF, NaOH $H_2SO_4$, DISTILLED $H_2O$ $FeCl_2$, $Ca(OH)_2$ and many others

"FLUID NEVER TOUCHES METAL"

Fluid only contacts outer surface of "FLEX-I-LINER" and inner surface of body block. 35 combinations of rubber and plastic "flex-i-liners" and pump body blocks. Models available from fractional to 20 G.P.M., Vinyl and compar "flex-i-liners" also available in pumps to 5 G.P.M. capacities. Widely used in chemical, food, pharmaceutical and other process industries—wherever non-contaminating pumping is required. Excellent for slurries. Write for literature.

NO GASKETS NO VALVES SELF LUBRICATING

VANTON PUMP CORP.

Empire State Bldg. Dept. CP11 N.Y., N. Y.

VANTON

NON CORROSIVE CONTAMINATING

flex-i-liner PUMPS

When inquiring check CP 6102 on handy form, pgs. 2-3


worm and gear reduction unit through a disc clutch and two-speed transmission. Platform can be raised 5¾" by means of hydraulic cylinder and a simple rocking link mechanism. Controls are similar to those of an automobile, except that brake and clutch pedals are operated from standing position.

Model GEP-6 (3-ton capacity) measures 125" long, 42¾" wide, 58" high, has platform 54 x 26½", and a wheel base of 64". The 5-ton model (GEP-10) is



Gas-powered low-lift platform truck has 3-ton capacity

138" long, 42¾" wide, 58" high, has platform 60 x 26½", and a wheel base of 59⅜" + 12¾". This model is equipped with dual set of trail wheels under the load platform to support heavy load. Dimensions given are standard, but can be altered for special load handling requirements.

(Development of The Elwell-Parker Electric Co., Dept. CP, 4205 St. Clair Ave., Cleveland, Ohio . . . or for more information check CP 6103 on handy form, pages 2 and 3.)

**No need to search high and wide . . .**

*for more information on something you read in these editorial articles. A letter to the company listed at the end of the article . . . or a mark on the Reader Service slip . . . will bring you what you want. This idea originated with CHEMICAL PROCESSING many years ago to help busy men like you!*

THE EDITORS

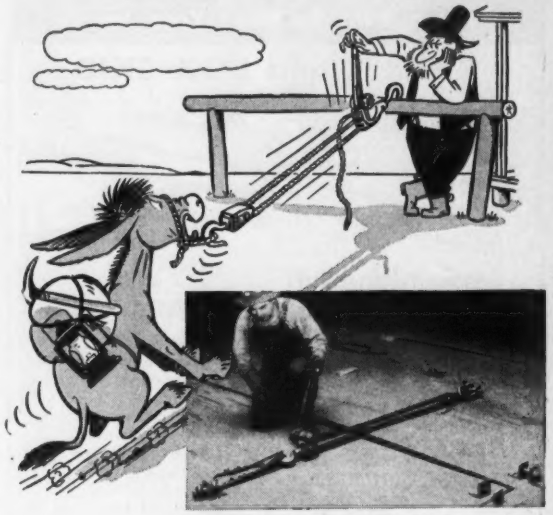
***Conveyors offer choice of size and type for every job***

Packages may be elevated, lowered, and conveyed horizontally by gravity or power with units illustrated in 28-page bulletin. Outline is included of specifications and uses for various units.

Bulletin describes types of roller and wheel conveyor units in addition to belt units. Engineering data include line drawings and many charts of specifications.

Bul 63C is issued by Standard Conveyor Co., Dept. CP, 63 Indiana Ave., N. St. Paul, Minn. When inquiring specify CP 6104 on handy form, pages 2 and 3.


There's a YALE hoist for every lifting need!



Uses for the YALE PUL-LIFT can be found in any industry where there is a necessity for low-cost pulling or lifting.

Industries of all types solve difficult *lifting* and *pulling* problems with the light-weight YALE PUL-LIFT. Universal ratchet action makes it easy to use . . . exclusive YALE design provides capacities up to 15 tons. Yes, your business can realize important savings in time, money and manpower by applying the YALE PUL-LIFT to countless maintenance and construction operations. CALL YOUR LOCAL YALE INDUSTRIAL DISTRIBUTOR FOR COMPLETE INFORMATION . . . he's listed in the classified pages of your local phone directory under the heading Hoists, Industrial.

YALE is a registered trade mark of The Yale & Towne Mfg. Co.

The Yale & Towne Manufacturing Co., Phila. 15, Pa.

YALE PUL-LIFTS

SOLD THROUGH INDUSTRIAL DISTRIBUTORS

MAIL THIS COUPON TODAY

The YALE & TOWNE Mfg. Co., Dept. 1211

Roosevelt Blvd. & Haldeman Ave., Philadelphia 15, Pa.

I'm interested in lifting for less with a YALE Hoist.

☐ Please have your local Hoist Distributor call on me.

Please send detailed literature on:

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Company_____

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In Canada write: The Yale & Towne Manufacturing Company Box 337—Postal Station "A"—Toronto

Gas and Electric Industrial Trucks • Worksavers Hand Trucks • Hand and Electric Hoists • Pul-Lifts

When inquiring check CP 6105 on handy form, pgs. 2-3

CONSULT *PS* FOR THE BEST
*Materials*
HANDLING EQUIPMENT
Custom Built To Meet Your Needs

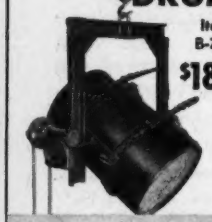
BARREL and BOX SKID
All steel-welded construction—light weight. Will stand up under the heaviest barrel or box. Skid measures 14" wide overall.
All Steel

Item B-470

Combination
TRUCK and DRAIN RACK

Loads Automatically
Moves barrels or drums, also serves as drain rack. Two styles—with or without detachable handles. Sturdy frame-welded construction. Weight approximately 90 lbs.
Item NS-506 $46.75
(Handles welded to frame)
Item NS-506 DH $48.95
(Detachable handles)

Vertical DRUM LIFTER
For handling open and closed steel drums in vertical position, by crane or hoist. All-steel, with heavily welded chain. Sure-hold safety barrel grip. Saves plant space. Use for either high or low ceiling condition.
Item C-465
$30.25


DRUM and BARREL TILT
Item B-731
$181.50

A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive.
Equipped with two safety type locking devices and all-steel, welded yoke. Hand-operated chain drive.

BARREL TRUCK
Loads Automatically. Three style wheels: metal, rubber or metal and pneumatic. Capacity 1000 lbs. 22" wide for narrow openings. Weight 85 lbs.

Item S-911M metal wheels $36.85
Item S-911R molded on Rubber Wheels $42.35
Item S-911P Pneumatic Rubber Wheels $49.30

WHEN ORDERING always give "item" number. ALL PRICES are f.o.b Detroit.
Prices subject to change without notice. Write for catalog.

DESIGNED AND MANUFACTURED BY
Palmer-Shile Co.
16016 FULLERTON AVENUE, DETROIT 27, MICHIGAN

When inquiring check CP 6106 on handy form, pgs. 2-3

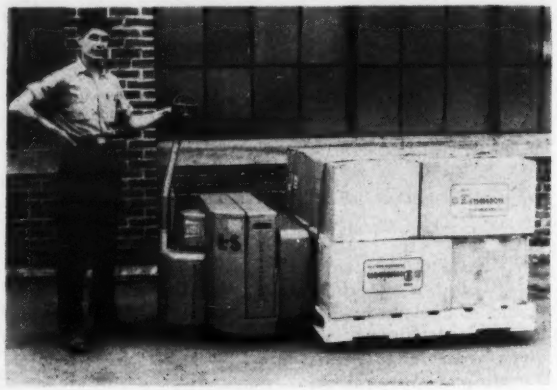
***Jerk-free starts, cushioned stops of walkie truck are controlled with handle head . . .***

electric powered unit gives twice the power with reduction of headroom by 15 per cent

**Uses:** For handling loaded skids or other material. Unit is especially well-suited for both freight car or truck unloading.

**Features:** Compact electric-powered unit reported to give twice the power and in 15 per cent less headroom. Other features listed include: 1) all controls in handle head to give operator quicker control over any maneuver, 2) vertical handle operation. Handle does not have to be extended down from full back position to disengage brake.

**Description:** In operation of 4000-6000 lb capacity Jacklift Electric Truck, timed acceleration eliminates



Allows maneuvering of 3-ton loads in close quarters

jerky starts, cushions stops. Design includes electric "deadman" type brakes, controlled by operator releasing his hand pressure on handle "trigger." Brake operates with handle in any position.

(Development of Lewis-Shepard Products, Inc., Department CP, Watertown, Massachusetts . . . or for more information check CP 6107 on handy form, pages 2 and 3.)

***Design of 4000-10,000 lb lift trucks extended to use either gas or diesel power . . .***

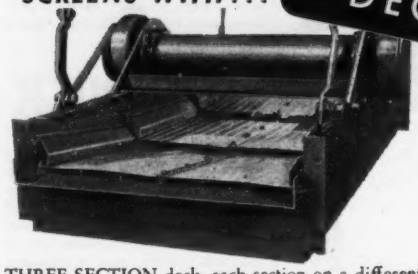
interchangeability of manufacturer's line permits greater flexibility in fuel preference

**Uses:** For general applications of gas or diesel-powered fork lift trucks.

**Features:** Wider flexibility where operating conditions and available fuel indicate preference for one type or the other.

**Description:** Design standardization program now makes it possible to install either gas or diesel engines in manufacturer's fork lift trucks in capacities from 4000-10,000 lb. Construction features listed for these trucks are: 1) improved driver visibility, 2) higher stacking, 3) higher lifting speed, 4) fingertip control for hoist, tile, and direction, 5) automotive controls including automotive-type hydraulic brakes, 6) pneumatic tires.

With waterproof engines, trucks are equipped with

SCREEN
Moist Fine Materials
Ripl-Flo SCREENS WITH . . . "Tri-Slope" DECK

THREE SECTION deck, each section on a different slope, increases capacity when screening fine materials. Screen deck is *Sta-Kleen* type which dislodges clogging moist particles.
Get more facts from the Allis-Chalmers representative in your area. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3858
*Ripl-Flo and Sta-Kleen are Allis-Chalmers trademarks.*
ALLIS-CHALMERS

When inquiring check CP 6108 on handy form, pgs. 2-3

GAYCO CENTRIFUGAL SEPARATORS
GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.
"TIMKEN BEARING EQUIPPED"
GAYCO brings you all these:
Range 60 to 400 mesh
greater capacity
25 to 30% greater production

Cleaner Tailings
Uniform Products
Slow speed for slow wear
Quick and easy adjustments
If you have an exceptionally hard separating problem, TRY THE GAYCO.
Universal Road Machinery Co.
Rubert M. Gay-Division
Factory and Laboratory, Kingston, N. Y.
117 LIBERTY STREET NEW YORK 6, N. Y.
Canadian Representative: F. H. Hopkins & Co., Ltd., 8500 Decarie Blvd., Montreal, Que.

When inquiring check CP 6109 on handy form, pgs. 2-3

# EXIT THE SHOVEL...



# ENTER THE Hapman

Sealed-pin Chain, Neoprene-flighted

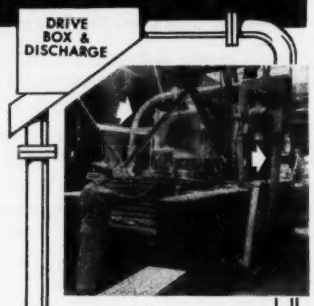
## TUBULAR CONVEYOR

for low-cost handling of bulk flowable materials — wet or dry

"Shovel labor" costs *plenty* — so do safety hazards and confusion caused by heavy aisle traffic. But there's a better way — the *Hapman Way!*

By handling innumerable bulk materials with Hapman Tubular Conveyors, you can slash these costs — and increase safety and efficiency! Can you handle metal chips from machine tools? *Yes!* Flour? *Yes!* Abrasive or corrosive chemicals? *Yes!*

Get details NOW — write Hapman, describing your problem. Ask for Bulletin CP-1152.




HERE a Hapman Tubular Conveyor picks up corn starch from base of a food processing unit, and elevates it to hopper above for re-processing. Widely used for FOOD and CHEMICAL handling, Hapman Conveyors tightly confine liquids, dust, fumes and odors.

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN

When inquiring check CP 6110 on handy form, pgs. 2-3




Diesel-powered unit can also be converted to gas power

fluid drive, have roller-equipped elevating carriage and upright channels.

(Development of The Yale & Towne Mfg. Co., Dept. CP, Philadelphia 15, Pa. . . . or for more information check CP 6111 on handy form, pages 2 and 3.)

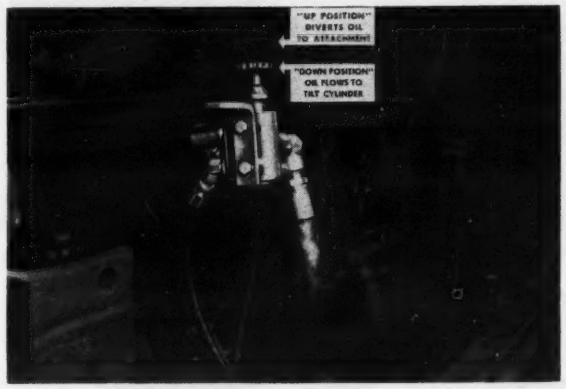
***Field installation of hydraulic devices on lift trucks is more feasible . . .***

special diverter valve utilizes tilting action of upright to control flow of oil in cylinders

**Uses:** On fork lift trucks with tilting uprights.

**Features:** Enables economical field installation of hydraulic attachments without use of conventional auxiliary valve, even with older models.

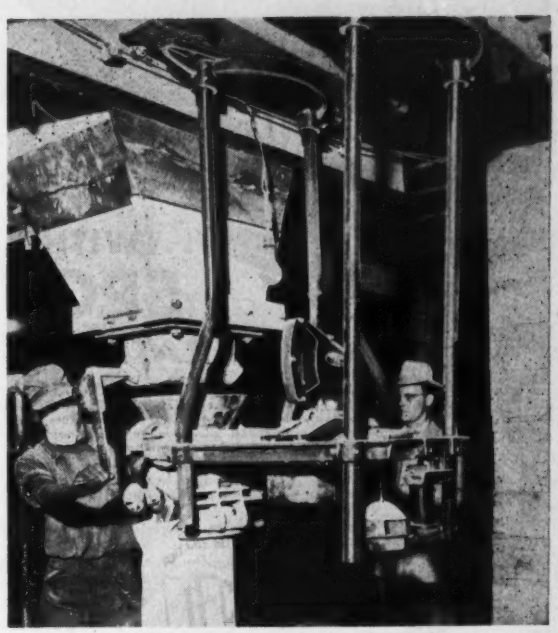
**Description:** Using standard tilt lever, as means of control, newly-designed Diverter Valve utilizes tilting action of truck's upright. When valve plunger is in




Allows quick installation of hydraulic attachments

"up" position, oil is diverted to attachment. When plunger is in "down" position, oil flows to tilt cylinders. The operator of the truck has normal control of tilting at all times.

(Development of Industrial Truck Div., Clark Equipment Co., Dept. CP, Battle Creek, Mich. . . . or for more information check CP 6112 on handy form, pages 2 and 3.)

*EXACT WEIGHT Sacking Scale operating at 5 to 8 bags per minute. Scale is reverse mounted to fit local mill conditions and afford more floor space.*

## Sound Chemical Packaging Depends Upon the Right Equipment . . .

Thousands of Products are weighed on hundreds of different types of scales. Using the wrong scale in the wrong place is poor business . . . wastes time and product and just costs too much today. For example the use of a catch weight scale in a pre-determined weight sacking operation, such as free flowing chemicals, may waste enough product alone to pay for the right equipment in a manner of weeks if you are in volume production. Uniform bags, controlled costs and adequate tonnage from bulk to bag are accomplished only with the right equipment correctly installed and adequately manned. EXACT WEIGHT Sacking Scales are built to meet this demand. They do it today and have been doing it for the past thirty-five years. Write for details for your plant.

THERE IS NO SUBSTITUTE FOR EXACT WEIGHT

# EXACT WEIGHT SCALES

BETTER QUALITY CONTROL
BETTER COST CONTROL

## THE EXACT WEIGHT SCALE COMPANY

904 W. Fifth Ave., Columbus 8, Ohio
2920 Bloor St., W, Toronto 18, Canada

When inquiring check CP 6113 on handy form, pgs. 2-3

Keep materials moving ...WITH SPO AIR VIBRATORS

BULK POWDERED AND GRANULAR MATERIALS FLOW STEADILY FROM BINS, HOPPERS AND CHUTES equipped with low-cost SPO air vibrators. Powerful high-speed blows delivered by these sturdy units put an end to clogging and packing.

Full-power starting, high-speed operation, low air consumption and maximum service life are assured by a special corrosion-proof bronze alloy cylinder liner.

Whatever your vibration requirements, SPO has a model that will do the job.

Write today for Bulletin No. 50.

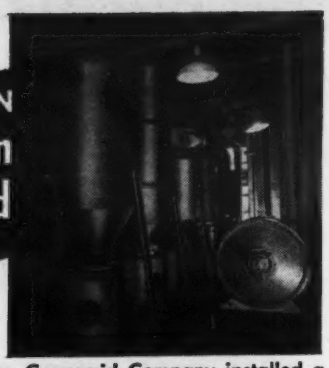
SPO INCORPORATED

6531 Grand Division Ave., Cleveland 25, Ohio

When inquiring check CP 6114 on handy form, pgs. 2-3



SPENCER VACUUM IN American Cyanamid Plants



Ten years ago American Cyanamid Company installed a Spencer stationary vacuum cleaning unit to remove excess dusts resulting from the manufacture of plastic powders. Today Spencer stationary units with a total of 135 horsepower are used almost continuously to remove excess powder from floors, machines, walls and pipes. The material is collected by the barrel and sold for fertilizer. Spencer portables are used all over this plant in locations not reached by the stationary vacuum lines.

Spencer Vacuum has more than 100 uses in industry. It reclaims metals, conveys materials, cleans machinery, and goods in process. It handles hot materials, liquids, sand, rice, injurious dusts and gases and invariably pays for itself in a few months. Ask for Bulletin No. 144.

THE SPENCER TURBINE COMPANY • HARTFORD 6, CONNECTICUT

SPENCER HARTFORD

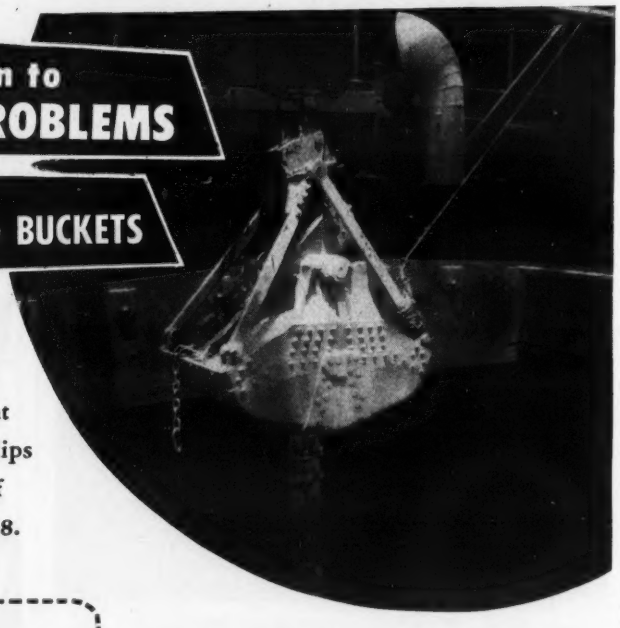
439-F

When inquiring check CP 6116 on handy form, pgs. 2-3



Here's the Solution to CONTAMINATION PROBLEMS

BLAW-KNOX *Tight-Lip* BUCKETS



NOW you can handle granular fines without danger of contamination! Blaw-Knox Chemical and Fertilizer Buckets are equipped with tight fitting cast and ground abrasive-resisting steel lips that stop leakage. For a detailed description of all the important features, write for Bulletin 2378.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2076 Farmer's Bank Building • Pittsburgh 22, Pa.
New York • Chicago • Philadelphia • Birmingham • Washington • San Francisco

BLAW-KNOX CLAMSHELL BUCKETS
FOR CHEMICAL AND FERTILIZER PLANTS

*THERE'S A SIZE AND TYPE FOR EVERY NEED:*

Bauxite • Cement Clinker • Gypsum Rock • Plaster Rock • Limestone • Kainit & Manure Salts • Magnesite • Milorganite • Muriate of Potash • Phosphate Rock • Potash • Pyrites • Super Phosphate • Sodium Nitrate • Sulphate of Ammonia • Ilmenite • Sulphur, etc.

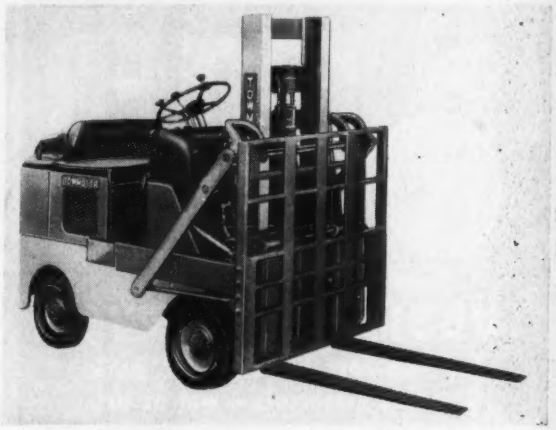
When inquiring check CP 6115 on handy form, pgs. 2-3


***Lift truck attachment pushes loads into place . . .***

mechanical unloading eliminates manual handling

Device for mechanically loading freight cars, trucks, and placing materials in storage is completely controlled from operator's seat in fork lift truck. Accessory is metal grating which fits flush to vertical bars of lift truck. When truck is to be unloaded, mechanical arms extend 49" and push load into place.

Unloader attachment is designed to eliminate any need for manual handling. It is constructed so that it cannot interfere with normal operation of lift truck. Hydraulic



Unloader attachment fits flush to vertical bars of lift truck

action to move unloader is controlled by lever located at operator's fingertips. Attachment may be used with most of manufacturer's trucks.

Grating or screen width ranges from approximately 45 to 67 inches. Height of screen above horizontal forks varies between 42-¼ and 49-¾ inches. A stroke which is shorter than standard 49 inches may also be furnished with this attachment.

(Product of Towmotor Corporation, Dept. CP, 1226 E. 152nd St., Cleveland 10, Ohio . . . or for more information check CP 6117 on handy form, pages 2 and 3.)

***Bulletins describe equipment for materials handling***

Four bulletins describe equipment for loading, flattening, elevating, and conveying bagged materials. Bul 50 refers to unit used for loading or unloading bags shipped in trucks or railroad cars. Unit has capacity of 30 bags per minute. Bul 60 discusses three different types of equipment — bag flattener, pallet loader, and bag elevator — which were designed to aid in saving space, reducing damage, and modernizing packaging operations and appearance.

Bul 70 deals with a power-driven bag flattener. Bul 80 covers bag packer-conveyor unit which offers cleaner packages and increased dependability of operation.

Features, specifications, details of operation, and photos of typical installations for each type of equipment are included in respective bulletins. Bulletins are issued by Power-Curve Conveyor Co., Dept. CP, PO Box 1146, Denver, Colo. When inquiring specify CP 6118 on handy form, pages 2 and 3.

***One truck replaces 25 tank cars . . .***

moves six loads of sulfuric acid per day on short haul

Approximately 25 tank cars were needed to transport sulfuric acid now handled by one truck. Large number of tank cars was needed because of the short haul and slow turn-around time. Truck averages better than six loads per day transporting a 20 ton payload.

Product moves between Dominguez, Calif. and Vernon, Calif., a distance of about 14 miles. Truck operates on an around-the-clock basis, twenty-four hours per day, seven days per week. Other chemicals and acids transported by trucking company include muriatic acid, phosphoric acid, copper cyanide, nickel sulfate, molten sulfur, hydrogen sulfide, styrene, dibutyl phthalate, and methanol.

(Information received from Allyn Tank Line, Department CP, 2445 East 26th Street, Los Angeles, California . . . or for more information check CP 6119 on handy form, pages 2 and 3.)

***Illustrates materials handling equipment***

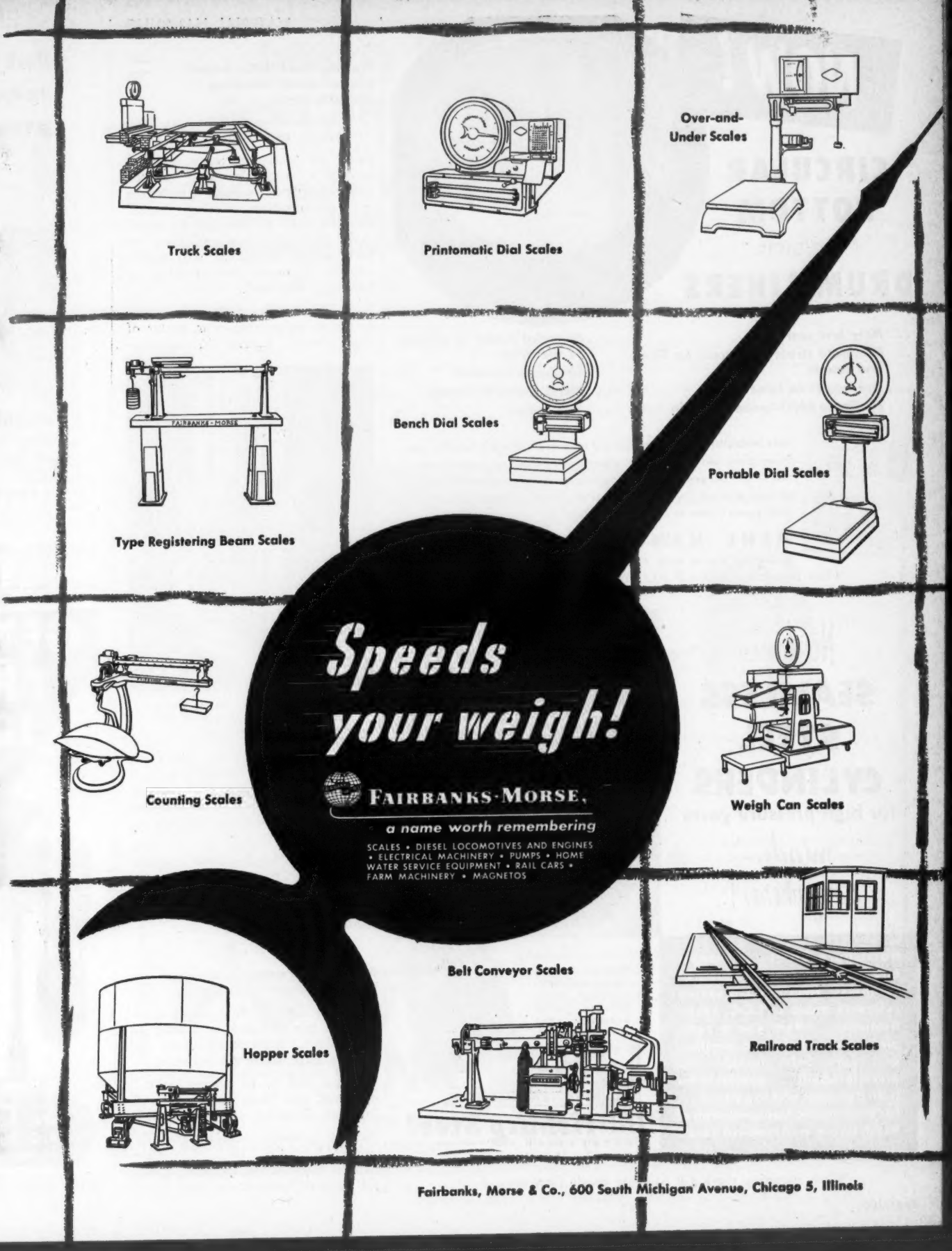
Single-sheet bulletin pictures feeder valve and roll crusher for handling solid materials. Cutaway views and photographs show construction of units.

Feeder provides continuous loading or unloading from chamber under slight pressure or vacuum with minimum air leakage. Vanes of various compositions keep materials from binding rotor. Maker reports unit will stand pressures of 20-22 inches of water with leakage of approximately 20 cfm.

Roll crusher may be used as precrusher or as an independent unit. Handles soft, semi-hard, or tough materials. Friction overload clutch with manual reset is completely automatic in operation. Clutch unit has wide range of torque capacities.

"Mikro Airlock and Mikro Roll Crusher" is issued by Pulverizing Machinery Company, Department CP, 15 Chatham Road, Summit, New Jersey. When inquiring specify CP 6120 on handy form, pages 2 and 3.

For more information on product advertised at right, specify CP 6121 . . . see information request blank between pages 2-3.

NOW!

CIRCULAR BOTTOM

*Polyethylene*

DRUM LINERS



- . . . New low cost
- . . . Eliminate stress and strain on liner and seams
- . . . Are easier to insert
- . . . Eliminate pinch-points and pin-holes
- . . . Material easier to get out of the drum
- . . . Eliminate mandril
- . . . MEHL Liners fit better
- . . . Last longer



FREE BOOKLET . . . describes uses and advantages of MEHL Polyethylene Plastic Drum and Carton Liners which save container costs, packing costs, tare weight charges, wasted material and salvage costs in the shipment of all sorts of liquids, semi-liquids and solids . . . write for your copy today. Also request "Guide to Military Packaging."

MEHL MANUFACTURING CO.

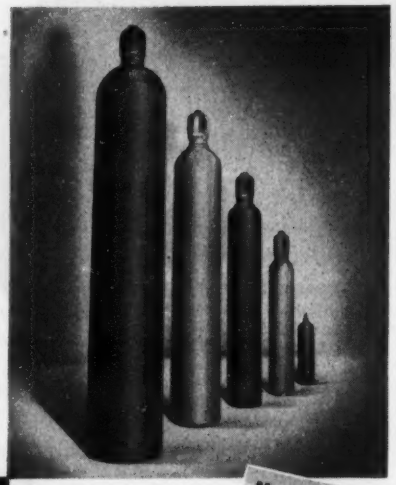
Reading Road and Florence Cincinnati 2, Ohio

When inquiring check CP 6122 on handy form, pgs. 2-3



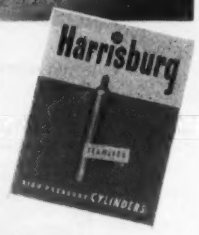
No finer SEAMLESS STEEL CYLINDERS for high-pressure gases made anywhere!

HCC52-2



Harrisburg Steel . . . pioneer and world's largest producer of seamless steel high-pressure cylinders made to I.C.C. specifications . . . offers you a complete range of sizes, capacities, and types. Safe, durable, and precision-built . . . available for both domestic and export use . . . for storage and transportation of fixed, liquid, and medical gases.

Have you seen this *Harrisburg Cylinder Catalog*? Copy will be mailed promptly upon written request.




99 Years in Pennsylvania's Capital

Harrisburg Steel CORPORATION HARRISBURG 24, PENNSYLVANIA

When inquiring check CP 6123 on handy form, pgs. 2-3

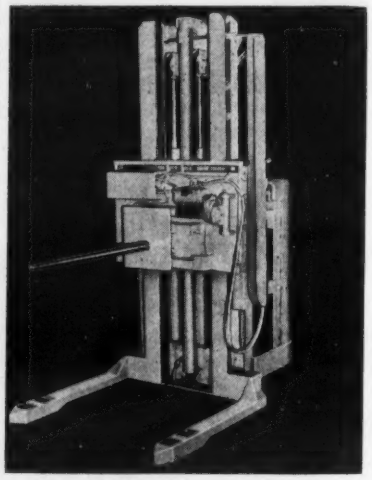

## MATERIAL HANDLING

***Tiering truck attachment makes exact stacking an easy task . . .***

side-shifting ram has six inch lateral movement

Coils of steel or other bundles having a center opening can be easily handled by ram attachment for straddle-type, tiering trucks. Bundles may be elevated to maximum of 130 inches and then six inch lateral movement will enable perfect alignment for stacking or lowering the load.

Ram attachment will move three inches to either side from center of truck's mast. Lateral shifting combined with lowering or raising the mast will align the ram with the center opening. Manufacturer's standard tractors are equipped with accessory and are serviceable in aisles only six feet wide.



**Ram attachment for tiering trucks simplifies handling of bundles with center opening**

(Product of The Raymond Corporation, Dept. CP, 5790 Madison St., Greene, N. Y. . . . or for more information check CP 6124 on handy form, pages 2 and 3.)

***Specs and uses of wire slings***

Complete data on three major specifications are included in catalog of wire slings. Recommended uses and loading information are described.

Material will be of interest to mill operators and those concerned with materials handling, safety equipment.

Catalog is issued by The Cambridge Wire Cloth Co., Dept. CP, Cambridge, Md. When inquiring specify CP 6125 on handy form, pages 2 & 3.


Put your high-vacuum requirements on a production line basis



The Eimac HV-1, oil-diffusion type vacuum pump, because of its construction features assures consistently dependable operation characteristics. When this high-efficiency pump is used with Eimac type A oil, an ultimate vacuum of 4 x 10-7 mm of mercury may be reached.

Rapid pumping speeds and simplicity of maintenance enable the HV-1 to produce more units-of-work during a period of time than conventional pumps of similar size. Write for complete technical data.

- ★ Clear Glass Pump Barrel
- ★ No Liquid Cooling
- ★ No Charcoal Trap
- ★ No Mechanical Wear
- ★ Maintenance without Special Tools or Skill
- ★ Simple Pipe Flange Vac-System Connection

WRITE

HV-1 VACUUM PUMP

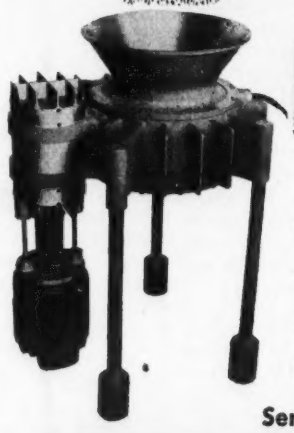
EITEL-McCULLOUGH, INC.

2281 SAN MATEO AVENUE • SAN BRUNO, CALIFORNIA

When inquiring check CP 6126 on handy form, pgs. 2-3



GET RID OF TRAMP IRON . . . . *in finely ground materials with the* FRANTZ FERRO FILTER



You'll save dollars and help insure the purity of your product by running dry powdered and granular materials through this electromagnetic separator. Equipped with vibrator to speed flow. Both small and large steel and iron particles are caught on magnetized vanes. Other models available for handling liquids.

Send for BULLETIN 46

S. G. Frantz Co., Inc.

P. O. Box 1138 Trenton 6, N. J.

Manufacturers of Permanent Magnet and Electromagnetic Separators

When inquiring check CP 6127 on handy form, pgs. 2-3

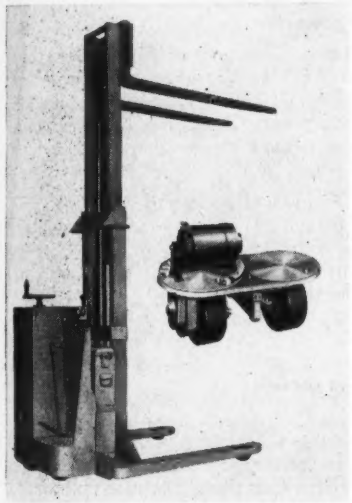
***Materials can be stacked 11′ high with electric lift truck in 6′ aisle . . .***

unit proves sturdy versatile in confined spaces — makes the most of the least floor area

**Uses:** For moving, stacking, general handling of materials, especially in tight quarters and where exhaust gases from fuel-powered trucks are prohibited.

**Features:** Unit is especially versatile in confined spaces, can stack material 11′ high while working in 6′ aisle.

**Description:** Secret of Transveyor electric lift truck is that forks and uprights are set at right angles to driving unit. Basic model handles 2500 lb load 48″ long. There are two mast heights: 68 and 83 inches. The former provides 102½″ of telescopic lift, the latter 132½″. The manufacturer claims it is the only battery-powered industrial truck in its field with four wheels having three-point suspension, which provide for balanced action in equalizing load on both front wheels regardless of floor conditions.



Handles material 11′ high in a 6′ aisle

Operator, protected by a sideguard, stands on non-skid safety plate at rear of truck. Steering is done with left hand; other controls are operated with right hand, except for brake pedal. Truck can be built with all three speeds controlled either by hand or foot, or any combination of the two. Battery can be easily removed from either the top or side. By removing battery cover, battery can be charged in the truck.

Transveyor is 29⅞″ long, plus load length and lifts 2500 lb pallet load 20 fpm. Horizontal speed when loaded is 4 mph. Truck is available in either telescopic or non-telescopic models.

(Development of Automatic Transportation Company, Dept. CP, 149 W. 87th St., Chicago 20, Ill. . . . or for more information check CP 6128 on handy form, pages 2 and 3.)

***Chart shows guides for buying electric fork trucks***

Handy comparison chart is designed to permit potential fork truck buyer to quickly make comparisons of various fork truck makes. Chart lists buying guides and includes space for comparative analysis of several points by the buyer. Handy size permits filing and reference.

"Electric Fork Truck Comparison Chart" is issued by Lewis-Shepard Products, Inc., Dept. CP, Watertown, Mass. When inquiring check CP 6129 on handy form, pages 2 and 3.

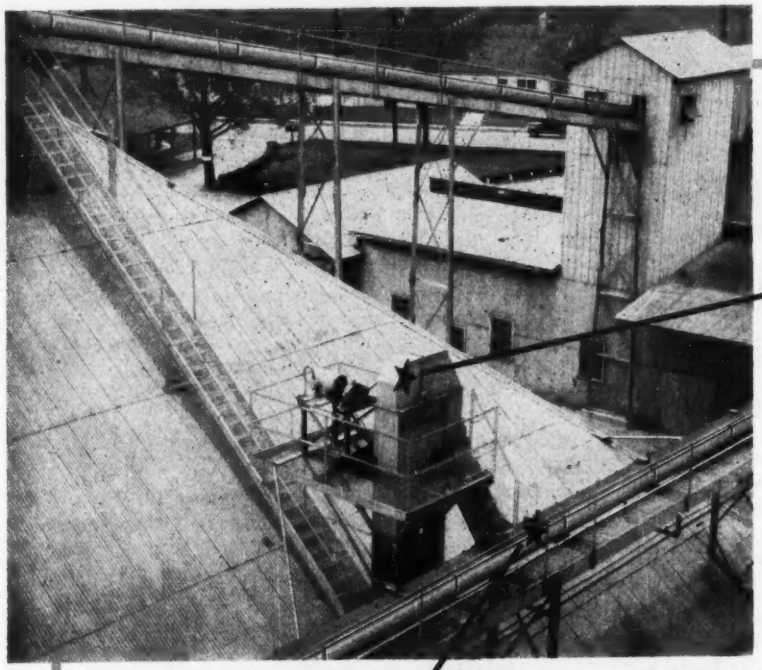

# Industry's BEST SOURCE for Bucket Elevators and Screw Conveyors

## LINK-BELT offers you the most diversified line of both . . . plus wide engineering experience

Get the right bucket elevators and screw conveyors for your requirements. Actually, it may be simpler than you think. For, whether your material is sticky . . . friable . . . hot . . . or abrasive — there's a Link-Belt design to move it with the highest possible efficiency.

Link-Belt builds many types and sizes of enclosed conveying equipment — the *widest range* of bucket elevators, screw conveyors and Bulk-Flo elevator-conveyors. And all are accurately made to assure smooth operation, long life.

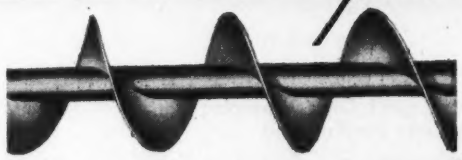
Take advantage of Link-Belt's quality line and materials handling experience. Our engineers will be glad to help you come up with the right answers to your conveying and elevating needs.





Continuous bucket elevator delivers high capacities at lower speeds. Ideal for friable materials.

Two Link-Belt Screw Conveyors and a Link-Belt Bucket Elevator move large volumes of cottonseed at an Illinois oil mill.



Helicoid or sectional conveyor screws — for general screw conveyor applications — may also be furnished in the metal and finish best suited to your purpose and with components selected from the most complete line.

LINK-BELT

BUCKET ELEVATORS and SCREW CONVEYORS

LINK-BELT COMPANY: Chicago 8, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities. 12,380-A

When inquiring check CP 6130 on handy form, pgs. 2-3



NEW!

"QUIKUPL"*

Stainless Steel Fittings

Join Tubing or Pipe Without Threading, Flaring or Welding

**"QUIKUPL" – a *completely new* stainless steel fitting – makes possible the assembling of tubing and pipe lines without threading, flaring, sweat-soldering, brazing or welding. Tubing or pipe is simply cut to length, deburred, and inserted into the fitting – tightening a small screw then completes the coupling.**

**Resilient sealing ring in "Quikupl" maintains squeeze fit . . . pressure in line causes positive seal between fitting and tube or pipe. Sealing ring is nontoxic to foods, and resistant to most chemicals. Couplings, tees, adapters and elbows (45° and 90°) are available from Frasse warehouse stock in Types 304 and 316 stainless steel—sizes for tube and pipe range from 1" to 4" O. D. For complete details on "Quikupl" stainless steel fittings write for Engineering Memo #7.**

*Reg. U. S. Pat. Off

Peter A. FRASSE and Co., Inc.

17 Grand Street, New York 13, New York
Lyndhurst Philadelphia Buffalo Syracuse

When inquiring check CP 6131 on handy form, pgs. 2-3


## Expanding Chemical Production

**$18 million for ammonia-urea plant launches Grace in chemicals**

With the formation of a wholly-owned subsidiary and an investment of nearly $18 million for construction of an ammonia-urea plant near Memphis, Tenn., W. R. Grace & Co., international industrial and trading concern, has entered the chemicals production field.

The new firm, known as the Grace Chemical Company, will have its first manufacturing unit on a 277-acre site in the Woodstock area, approximately six miles from Memphis. The plant, first of its type in that state, is expected to be in production in the summer of 1954.

Nitrogen in the form of ammonia and urea for both agricultural and industrial uses will be produced by the new unit. Future plans, already underway, also call for the integration of other petro-chemical manufacturing operations into the new plant.

**Cellulose future gets $25 million silver lining in Georgia**

Cornerstone laying ceremonies were held recently for construction of a $25 million chemical cellulose plant at Jesup, Ga., for Rayonier, Incorporated.

The new plant is the fifth built by the company in the same town and is expected to provide a wider market for the southern pine tree as a source for chemical cellulose. Current production by Rayonier accounts for approximately 60 per cent of the nation's output.

**Sylvania increases facilities for packaging studies**

Sylvania Division, American Viscose Corp., has extended its packaging development work and customer service through increased laboratory facilities and personnel at the firm's research department, Marcus Hook, Pa.

New equipment there will enable the company to study all types of packaged products, film, packaging materials, and packaging under conditions met in the trade.

**Await gov't OK for building Nebraska fertilizer unit**

Construction of a plant at La Platte, Neb., for producing ammonia and urea fertilizers by the Nitrogen Div., Allied Chemical & Dye Corp., is being temporarily delayed, pending Federal approval of the company's contract in having gas supplied to the newly-acquired site.

However, preliminary engineering studies at the site have begun and a contract has been awarded to the Catalytic Construction Company, Philadelphia, which would carry out the major portion of the work — with the Nitrogen Division providing the "know-how" for the work.

**First chlorophyll production unit in Minn. now "on the line"**

Production of Minnichlor, Inc. plant 50 miles west of Minneapolis marks the first start-to-finish unit in Minnesota for extraction of chlorophyll from alfalfa. Production at the plant is expected to reach 75-100 lb per day by the beginning of next year. The plant is located at Enfield, seven miles west of Monticello.

**AEC names Goodyear as operator for $1 billion U-235 project**

Goodyear Tire and Rubber Company of Akron, Ohio, has been selected by the AEC as operating contractor for a proposed $1.219 billion U-235 producing plant to be built between Portsmouth and Chillicothe, Ohio, in Pike county. The plant is expected to be completed in four years.

Goodyear will put individual units of the gaseous diffusion plant into operation as they are completed and will work closely with Union Carbide and Carbon Corp., operating contractor for a similar plant at Oak Ridge, Tenn. and Paducah, Ky.

**Hooker plans Canadian growth, forms new subsidiary**

Formation of a new Hooker subsidiary, Hooker Chemicals, Ltd., a British Columbia corporation, has been announced by Hooker Electrochemical Company, Niagara Falls, N.Y.

The new Canadian company is acquiring a plant site of approximately 60 acres on Burrard Inlet in the district of North Vancouver, B.C. No definite plans have been made as to date or other details of construction. At present, approximately $300 million in new pulp and paper expansion is either in progress or on planning boards for this area by the company.

**Expand chlorophyll extraction facilities in Florida**

Expansion of facilities at Lake Worth, Fla., for extracting chlorophyll from alfalfa meal is being undertaken by American Chlorophyll Division of Strong, Cobb and Company.

**Mathieson-Squibb merger approved after three-month wait**

Shareholders of both the E. R. Squibb & Sons, pharmaceutical firm, and the Mathieson Chemical Corp. have approved the merger of the two firms.

Legal and financial details were completed in less than three months — unprecedented in industrial mergers of this magnitude. Although Squibb will operate as a

separate division of Mathieson, it will retain its own policies and standards.

Under terms of the merger agreement, Mathieson will be the surviving corporation and will have an authorized capital of 250,000 shares of preferred stock and seven million shares of common stock. Each share of Squibb common stock will receive three-fifths of a share of Mathieson common so that the outstanding common stock of Mathieson after the exchange will amount to 5,439,930 shares. Squibb's two preferred stock issues will be replaced by two issues of subordinate debentures of Mathieson.

**Expand research lab facilities for petro-chemicals**

Construction has begun on a half-million-dollar addition of research lab facilities to the Jefferson Chemical Company's location at Austin, Texas.

The larger of the buildings will provide bench-scale research facilities while the smaller building will add to present office and library space. Both structures will cover an area of about 60 x 200 feet.

**Carbon disulfide plant almost completed near Mobile, Ala.**

Completion late this Fall of a new carbon disulfide plant constructed for Stauffer Chemical Company on a 47-acre site north of Mobile, Ala., has been announced. The plant, started in May of this year, consists of a 220 x 150' single-story building, approximately 43' high.

**Expand output facilities for synthetic bristles**

Manufacturing facilities for production of synthetic brush filament have been doubled at the Pittsburgh Plate and Glass Company's Baltimore, Md., plant.

The recent increases were undertaken to meet greater demands for suitable paint brush bristles since the supply of hog bristle to this country from Communist China has been considerably reduced. The synthetic bristle, first introduced as a war-time substitute for hog bristle, is reported to have the same rate of wear as the hog bristles. In some cases it is reported to be superior, e.g., the elimination of brush marks and the ability to resist softening effects of water.

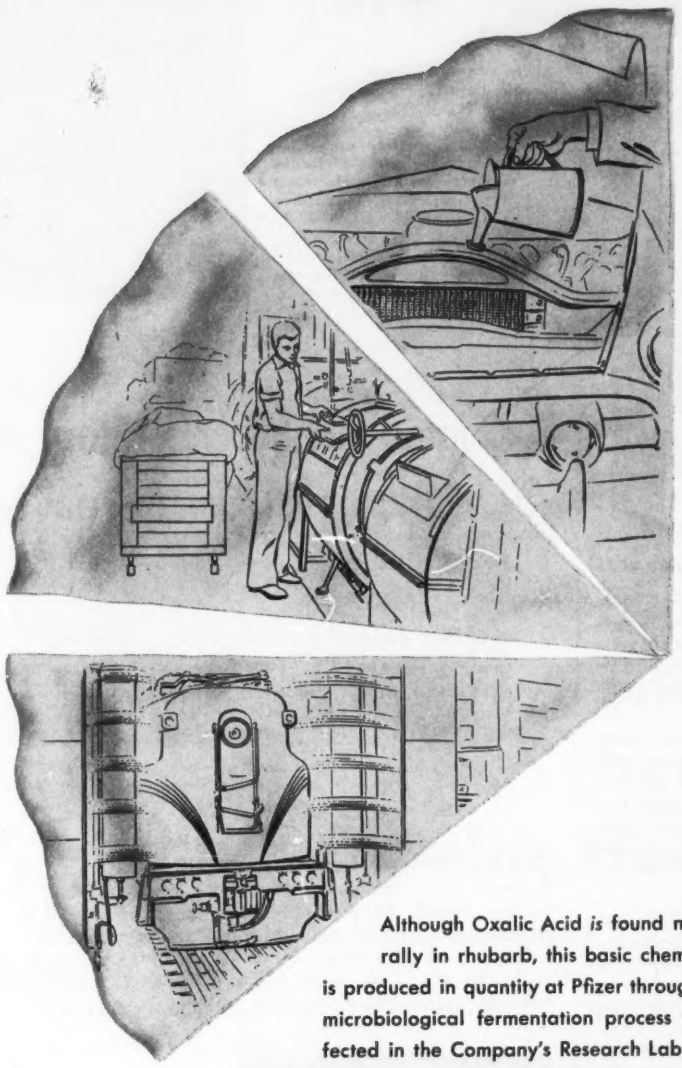
**New plant will add 1.5 million gal to annual paint production**

A new paint production plant, rated with a 1.5 million gal annual output, and reported as one of the largest in the southeast area, has been formally opened at East Point, Ga., by the Pittsburgh Plate Glass Company.

Situated on a 14-acre tract approximately six miles southwest of Atlanta and comprising 130,000 sq ft of plant and office space, the plant is the company's third ultra-modern paint producing unit to be put into operation in recent years.

Production will consist of a complete line of house paints, varnishes, enamels, resins, plus industrial and specialty finishes. Tank farm storage at the rear of the plant provides a reserve for 250,000 gal of liquid raw materials which are pumped to manufacturing points by a remote control system.


Rhubarb's Fine for Pies...





but it won't fill your needs for

# Oxalic Acid

Although Oxalic Acid *is* found naturally in rhubarb, this basic chemical is produced in quantity at Pfizer through a microbiological fermentation process perfected in the Company's Research Laboratories. The Pfizer process yields Oxalic Acid of high purity.

Because of its ability to solubilize iron oxide, Oxalic Acid is highly effective as an ingredient of metal cleaning compounds, in radiator flushes and as a rust remover in textile and leather processing. Its bleaching properties make it useful as a laundry sour and in the treatment of straw, cork and leather.

For more detailed information on the varied uses of this important organic acid, write for Technical Bulletin #34.

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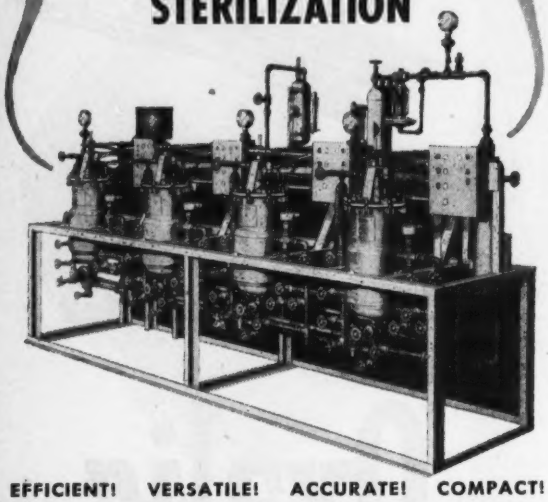
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When inquiring check CP 6132 on handy form, pgs. 2-3

# Flexible

## FERMENTATION UNITS CAPABLE OF COMPLETE STERILIZATION



**EFFICIENT! VERSATILE! ACCURATE! COMPACT!**

The basic Certified Fermentation Unit is available as a one vat unit or in combinations of 2-3-4 or more. Units come in 20 or 40 liter sizes for research laboratories and 30-50-100 gallon sizes for pilot plants. Larger sizes are available for production plants.

Use this versatile unit to accurately study experiments for producing antibiotics, vitamins and organic acids . . . to study the growth of microorganism in mass culture for food purposes or enzyme reproduction . . . or to study chemical reaction under controlled conditions.

***Check these advantages:***

1. Units allow for control of fermentation temperature, accurately and easily to within .25° C.
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3. Units can operate from zero pressure to 50 pounds per range of gauge.
4. Stirring rates and propeller pitch are easily adjusted.
5. Multiple units allow study of several experiments or variables at one time.
6. All parts are easily removable for cleaning, adjusting, or changing.

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**Stainless & Steel Products Co.**

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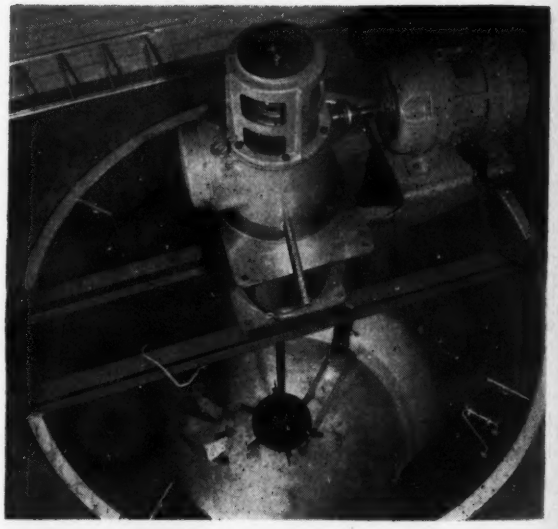
When inquiring check CP 6133 on handy form, pgs. 2-3



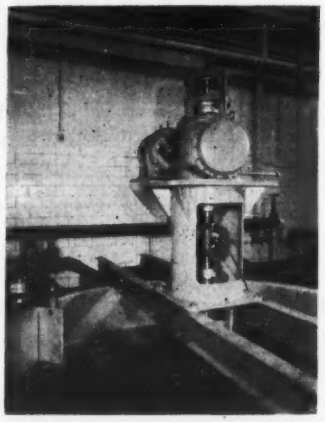

Motor control center includes electronic torque meter recorder, electronic potentiometer, recording wattmeter. Motors to 75 hp can be operated continuously from the panel; larger units can be operated intermittently

# Liquid-mixing Laboratory Minimizes Guesswork In Design of Commercial Installations

**Offers extensive facilities for working with processors' samples, but pushes fundamental research in mixing, too**



IN outward appearances, the unit operation of mixing seems to be non-complicated and easy to explain. To the uninitiated, the procedure of mixing two liquids together or of suspending a solid in a liquid may look like a simple process of getting a propeller or turbine big enough to do the job in the tank, and a motor huge enough to carry the load. But a large motor draws a lot of current, and current costs money. Then one begins to wonder if he can do the job with a smaller mixer and drive . . . so he can save on his electric bill and, also important, on his initial investment.



Looking down into 10,000 gallon tank set up to test impeller power consumption. Mixer has 25 hp motor, 36" flat blade turbine impeller. A tank seven times as big as this one — 70,000 gallon capacity — is now being installed at the laboratory

Strain gage type torque meter installed in test run. Recorder on control center panel board makes continuous record of what this device senses. From the trace, impeller power consumption at any specified time may be calculated

Chances are that the processor cannot take the time to do experimenting on his own, even if he had the proper equipment, so he must look elsewhere for an answer to his problem of specifying the equipment that will provide thorough mixing at lowest cost. True, he is aided by results of recent work on the theory of mixing, but the formulas developed up to this time are not too easy

for the processor to apply to his particular problem — especially when he is not set up to experiment. As yet, it is impossible for the processor to design a mixing installation entirely by "paper work."

It was just to help such men that Mixing Equipment Company, Inc., opened the doors of its new laboratory early in 1951. This laboratory is equipped to test samples from one quart to close to 10,000 gallons in volume; tanks with 70,000 gallon capacity are now being installed so that even larger scale testing will be possible. Scale-up from the laboratory work is producing commercial installations that perform as predicted.



**Sample test bench at laboratory where test materials' properties may be checked. Small, scale model mixers often provide enough data so that commercial installation can be designed. It is often advisable, however, to obtain more complete data in larger scale equipment**

In the large majority of cases the installation can be designed without extensive work in the laboratory, because of previous experience with a similar material. Perhaps a check of the sample's physical properties, and maybe the chemical properties too, will be enough to prepare the way for design. The laboratory is equipped with analytical tools and space to do this work, including remotely controlled fume hood and steam bath for toxic materials.

Whenever an unusual problem arises, the test work goes much further. The material is mixed in small transparent tanks under controlled conditions, using standard, accurate scale models of production size mixers. Most efficient impeller size, shape, speed, and position are determined from these tests. However, when necessary, the testing moves over to the large tanks where mixers as large as 75 hp can be operated.

A central motor control panel contains full instrumentation for these runs so that complete data may be taken. Research equipment includes modern strain gage torque metering and high-speed electronic recording instruments; many types of mechanical dynamometers for measuring impeller power consumption; high-speed motion picture equipment for making detailed flow studies in slow motion.

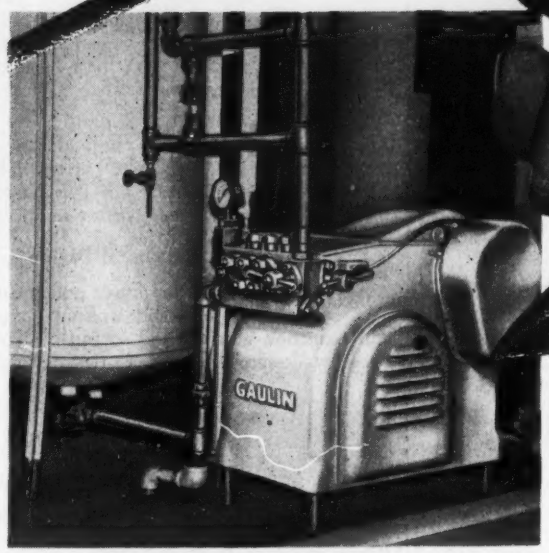
Mixing Equipment Co. has kept up with the trend of more extensive pilot planting by chemical processors. It is supplying accurate scale-model agitators to pilot plants so that interpolation to the eventual production plant will go easier and be more accurate.

### Fundamental Research

Application testing and customer service is only part of the story of the laboratory. A good portion of the work

(*Continued on next page*)


# It's Uniformly Finer here




**BRISTOL MEYERS** installation at Hillside, N. J. showing 500 GPH Gaulin Homogenizer used in processing Vitalis Hair Cream.




# because it's emulsified here

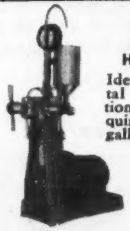
# ...with a Gaulin Homogenizer

Cream oils look less greasy, feel less greasy ... spread quicker, hold better when they're made with a Gaulin Homogenizer.

But most important, they WON'T SEPARATE EVER, because Gaulins break fluid particles smaller ... disperse them evenly to make a *uniformly finer* emulsion or dispersion.

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**GAULIN PILOT PLANT HOMOGENIZER**
Ideal for experimental purposes, operation or process requiring up to 25 gallons per hour capacity. Handles quantities as small as one pint. Available on low rental basis.



**GAULIN TWO-STAGE COLLOID MILL**
Stator is jacketed for cooling or heating. Gap setting adjustable for .001" to .045". Only 45 seconds clean-up required in changing colors. 12" head room. 12" x 17" floor area.

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*World's largest manufacturer of Homogenizers, Triplex Stainless-Steel High Pressure Pumps, and Colloid Mills*

When inquiring check CP 6134 on handy form, pgs. 2-3

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## Liquid-mixing laboratory

(*Continued from preceding page*)

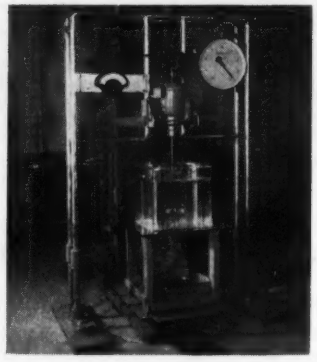
is in fundamental research to understand more about the theory of fluids mixing. Studies of factors affecting impeller power consumption are just about completed, at least the basic ones. Current work is devoted to the finer points . . . ironing out the rough spots, so to speak.

One study under way at the present time is attempting to determine the effect of viscosity and agitating variables on heat transfer coefficient in a baffled tank. When CHEMICAL PROCESSING visited the laboratory, a medium weight oil was being agitated in the tank while heat was being transferred through it from a steam coil to a water coil. At the same time the impeller power consumption was being measured continuously. According to Dr. James Y. Oldshue, Head, Development Engineering, it is the first time that heat transfer data have been taken along with impeller power consumption for helical coils in baffled tanks.

Although actually more in the realm of process development (or customer service), current lab studies of the effect of agitating variables on gas absorption coefficient should add some useful information to existing literature.

### Mechanical Design

Always important are the design and construction advances . . . better shaft seals and stuffing boxes, better motors, and reduction gearing, and so forth. The laboratory tries out new designs and gathers data to make improved designs possible. For instance, when we were there, a special mechanical shaft seal was being tried out in connection with a side-entering agitator installation. In another tank, deflector type strain gages, connected to a galvanometer type recorder, were checking the critical speed of a mixer shaft.



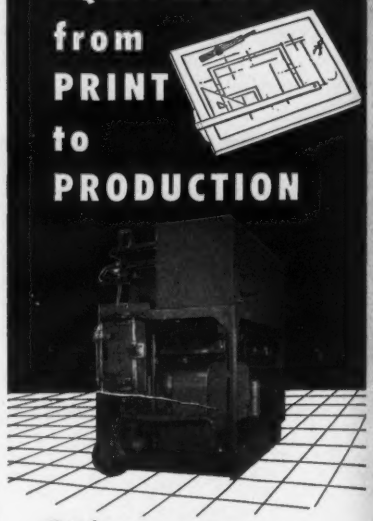
Flow studies, using high-speed movies, are made with this setup. Square tank surrounds the cylindrical tank to eliminate refraction. Mirror beneath provides view of bottom. Dynamometer shows impeller power consumption at any instant

(The Editors thank Mixing Equipment Co., Inc., Dept. CP, 135 Mt. Read Blvd., Rochester 11, N. Y., for courtesies extended in preparation of this story. For more information check CP 6136 on handy form, pages 2 and 3.)

### *Applications and properties of electroplating baths*

Metal fluoborate solutions available to the electroplating industry in commercial and experimental quantities are reviewed in sixteen-page booklet. More important applications of baths and their advantages are outlined and illustrated with numerous photographs.


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*What is your processing problem?*

Cold, heat, high pressure, vacuum or moisture in any combination? Bowser custom engineered equipment can provide the right answer.

Temperatures obtainable range from −100° F. or colder to +550° F. or more; moisture control from absolute minimum to saturation; and pressures from one micron to 500 p.s.i. and greater.

In addition to production models, Bowser's experienced technicians also design and construct laboratory size units to test process factors under consideration, and pilot-run models to assure maximum efficiency and economy.

Bowser provides *complete* processing equipment and engineering.

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Contents include descriptions of plating from eight specific types of metal baths and typical applications for each plating. General discussion of metal plating from fluoborate baths is given. Convenient table summarizes physical and chemical properties for seven fluoborate solutions. Information is included for equipment for use with metal fluoborate solutions. Application of fluoboric acid in metal finishing is outlined.

Handy list of available manuals for use in electroplating operations is included. Guide for selection of additional products for use in metal industries completes the data given here.

"Metal Fluoborate Solutions" is issued by General Chemical Division, Allied Chemical and Dye Corp., 40 Rector Street, New York 6, New York. When inquiring specify CP 6138 on handy form, pages 2 and 3.

***Catalyst quality improved through use of rotary tablet presses . . .***

easy dismantling and reassembly facilitates cleaning of units requiring minimum maintenance

Quality of material produced on rotary tablet machines is superior to that formerly made by another method, according to The Girdler Corp., Gas Process Div., specialty catalyst manufacturer. Only a minimum of maintenance has been necessary. Whenever presses are cleaned, they are easily dismantled and reassembled.

Catalysts are manufactured at Girdler on a battery of Stokes BB-2 and DDS rotary tablet machines. Material is pressed into cylinders, rings, or balls under pressures from a few hundred pounds to 2½ tons. Density, weight, and pre-



Rotary tablet presses making catalyst pellets

shrinking can be controlled within definite limits. Types of catalysts made include water-gas shift catalysts, nickel-base reforming catalysts, non-coking reforming catalysts, and nickel-base hydrogenation catalysts.

BB-2 machines produce 750 to 1400 pieces per minute in diameters up to ½" and depth of fill up to 11/16". Simultaneous pressure of punches from top and bottom assures pieces of uniform density.

(Manufacturer of tablet presses is F. J. Stokes Machine Co., Dept. CP, 5500 Tabor Road, Philadelphia 20, Pa. . . . or for more information check CP 6139 on handy form, pages 2 and 3.)


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FEATURING *lower cost per unit area of heat transfer surface,* National Carbon's new Series 310A "Karbate" Shell-and-Tube Heat Exchanger replaces the well known Series 240A Exchanger. Retaining all the time-proved advantages of its predecessor, this exchanger also provides new design improvements . . . products of many years' experience in the application of impervious graphite to heat transfer equipment.

Another new model, Series 90A, replaces the previous Series 70A to provide increased capacity and several new and improved features of construction.

**NO OTHER DESIGN OFFERS ALL THESE ADVANTAGES**

- Lower cost per unit area
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- Removable "Karbate" impervious graphite tube bundle with stainless steel baffles
- Asbestos composition, "Neoprene", or "Teflon" gaskets

**NO OTHER MATERIAL COMBINES ALL THESE PROPERTIES**

- Chemical resistance to practically all corrosive fluids
- High rates of heat transfer (three times that of carbon steel)
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*The terms "Karbate" and "Eveready" are registered trade-marks of Union Carbide and Carbon Corporation*

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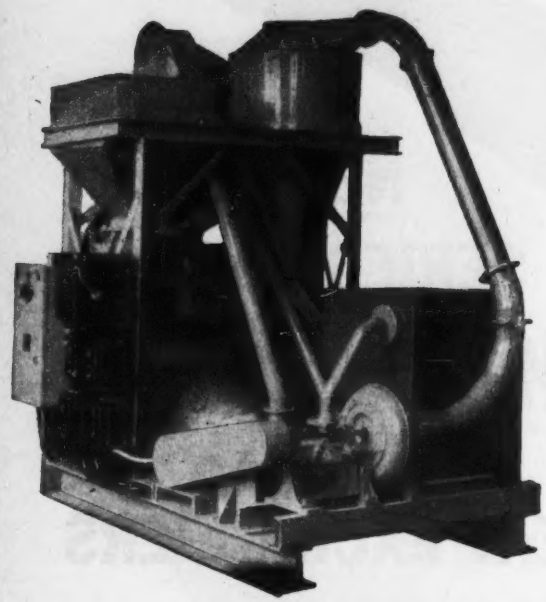
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"PACKAGED PULVERIZERS"
*for laboratory or small operations*



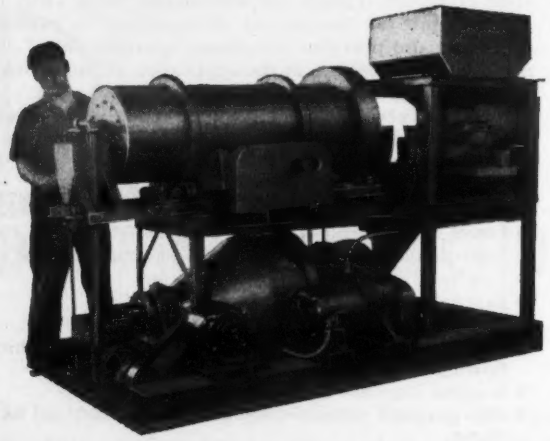


**DRY-GRINDING UNIT**

Make power connections only and the Hardinge DRY GRINDING UNIT is ready to perform. Self-contained and portable, 8' high. Complete with Constant-Weight Feeder, Conical Mill, Loop Classifier, dust collector, product collector and "Electric Ear" grinding control.

Bulletin AH-373-13.

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When inquiring check CP 6141 on handy form, pgs. 2-3


***Up to 3 gallons of water per hour is evaporated by self-contained, automatic humidifier unit . . .***

simple installation requires only suspension from ceiling and connection to services

*Uses*: For complete humidification systems, for spot humidification in large spaces, for boosting capacity of existing systems, as well as for precise humidity control in laboratories.

*Features*: Humidifier has a high capacity, evaporating up to 3 gallons of water per hour. Unit is self-contained and can be regulated automatically with manufacturer's humidity controls. Installation is accomplished quickly and easily by suspending from ceiling and connecting to water and electricity.



Water in humidifier is atomized by centrifugal force and distributed horizontally through 360° opening

*Description*: In Type E Unit Humidifier, water is atomized by centrifugal force and distributed horizontally through a 360° opening. Any portion of discharge opening may be blocked off for directional distribution. Each unit will humidify several thousand cubic feet of room volume at normal conditions, according to the unit's manufacturer. Two models are available with ⅛ and ¼ hp motors for respective evaporating ratings up to 1½ or up to 3 gallons of water per hour. Construction, except for heavy duty fractional-horsepower motors, is of non-corrosive metals with silver-gray hammerloid finish. Units measure 15½" high by 18¼" diameter and weigh 55 pounds.

(Manufactured by The Bahnson Company, Dept. CP, 1057 S. Marshall St., Winston-Salem, N. C. . . . or for more information check CP 6142 on handy form, pages 2 and 3.)

***Acids, alkalis and solvents all can be filtered with filter-pump units . . .***

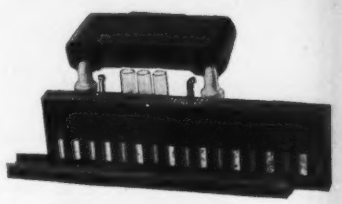
mobile models have synthetic resin filter assemblies that resist chemical attack, heat distortion

*Uses*: Filtration of practically any acid or alkaline solution — from pH 1 to 14.

*Features*: Pump and all fittings are Type 316 stainless steel. Filter assembly is made of a recently developed synthetic resin, "Sethrin," which has extreme chemical resistance and excellent temperature resistance.

*Description*: Models ASI-400 and ASI-600 are additions to manufacturer's line of filter-pump combinations. First has hourly capacity of 400 to 500 gal; second's capacity is 600 to 850 gph. Both are equipped with volute type centrifugal pumps and completely enclosed ball bearing


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Easy to use—accurate results in as little as two minutes—no fragile single standards to handle—these and many more advantages are yours when you use Taylor Comparators for determining pH, chlorine or phosphate, and the water analyzer for ammonia, silica, copper, fluoride, etc. All sets are complete with base, color standard slides, reagents and accessories. Practically all slides work on same base.

**COLOR STANDARDS GUARANTEED!**

There's no danger of mechanical inaccuracies when you use Taylor Comparators because all Taylor liquid color standards carry an unlimited guarantee against fading. Further, each complete set of color standards for any one determination is mounted in a sturdy plastic slide to practically eliminate the problem of breakage.

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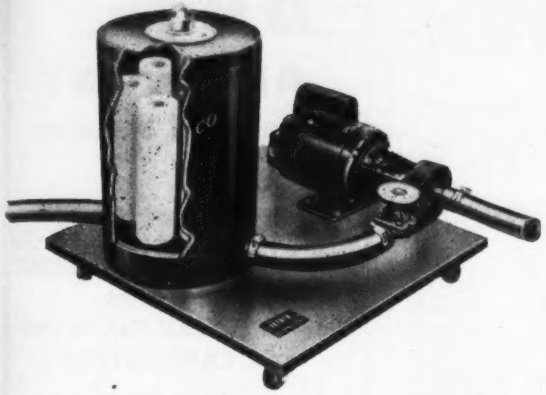

**WRITE DIRECT** for free handbook describing colorimetric methods and Taylor equipment for control of pH, chlorine, phosphate, etc. in 34 basic industries.

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YORK & ROGERS FORGE RDS. • BALTIMORE MD.

When inquiring check CP 6143 on handy form, pgs. 2-3

induction motors. They are mounted on heavy, polished Bakelite panels that have ball bearing, rubber covered casters. Each unit comes complete with 12′ lengths of chemical inlet and outlet hose.

The Sethrin filter element is resistant to sulfuric acid up to 50%, nitric acid to 25%, hydrochloric acid in all concentrations, sodium hydroxide to 50%, and ammonium



Cutaway section of filter tank shows synthetic resin filter elements inside

hydroxide to 50%. No organic solvent in common use will attack the resin at room temperature. It is thermosetting, resistant to heat distortion up to a temperature of 220°F.

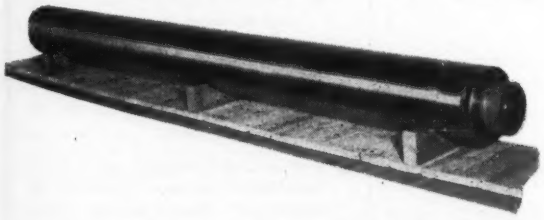
(Manufacturer is Sethco, Dept. CP, 70-78 Willoughby Street, Brooklyn 1, New York . . . or for more information check CP 6144 on handy form, pages 2 and 3.)

***Internal parts of reactor for use to 10,000 psi are titanium . . .***

units measuring 9′ long by 6″ diam now being made

*Uses*: Titanium-lined reactors are for high-pressure research work in lab and pilot plant. Units are designed for working pressure of 10,000 pounds per square inch at 350°C, but are tested at pressures to 15,000 pounds per square inch.

*Features*: The reactors are believed to be the largest



High-pressure reactor has titanium lining and cooling coils

of their type ever built — 9′ long, with inside diameter of 6″. They are now in production.

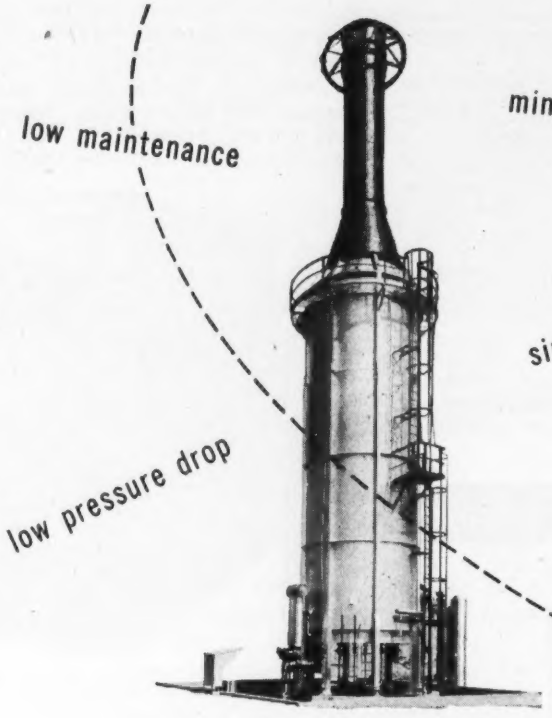
*Description*: Lining is made from pure titanium, as are the cooling coils. Covers are titanium forgings 6″ in diameter.

(Autoclave Engineers, Inc., Dept. CP, Erie, Pa. . . . or for more information check CP 6145 on handy form, pages 2 and 3.)


# most efficient

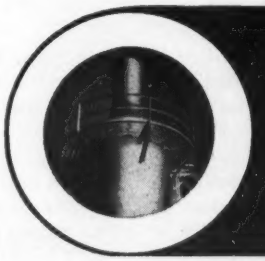
**PETRO - CHEM ISO - FLOW FURNACES**

# by any comparison




**BETTER HEAT DISTRIBUTION...** **maximum outlet temperature can only be obtained with uniform heat distribution and it's the uniform heat distribution characteristic, inherent in the design of Petro-Chem Iso-Flow Furnaces that permits optimum operating efficiency of gas cracking units . . . maximum production of catalytic cracking feed stocks . . . maximum yields of overhead products in vacuum operation.**

*More than 1000 are in operation throughout the world in the petroleum, chemical and allied industries . . . for all processes and for any duty, pressure, temperature and efficiency . . . and all Petro-Chem Iso-Flow Furnaces are pre-eminently satisfactory.*



**PETRO-CHEM ISO-FLOW FURNACES**

UNLIMITED IN SIZE . . . CAPACITY . . . DUTY

**PETRO-CHEM DEVELOPMENT CO., INCORPORATED**

122 EAST 42ND STREET, NEW YORK 17, N. Y.

Representatives: Bethlehem Supply, Tulsa and Houston · Flagg, Brackett & Durgin, Boston · D. D. Foster, Pittsburgh · Faville-Levally, Chicago · Lester Oberholtz, California · Gordon D. Hardin, Louisville, Kentucky

When inquiring check CP 6146 on handy form, pgs. 2-3

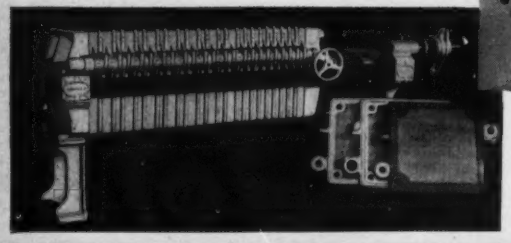
**FOR PROFITABLE OPERATION**

*Install* **SHRIVER**

**Filter Presses**

**Whether it's adhesives or amines, electrolytes or emulsions, casein or colors, mercaptans or mucilage, resins or rosin, or hundreds of other process materials that need improvement through filtration—the Shriver Filter Press can do the job better, at lower over-all cost. It's more versatile, more economical—a profitable investment in every way. Write for new Catalog No. 52.**

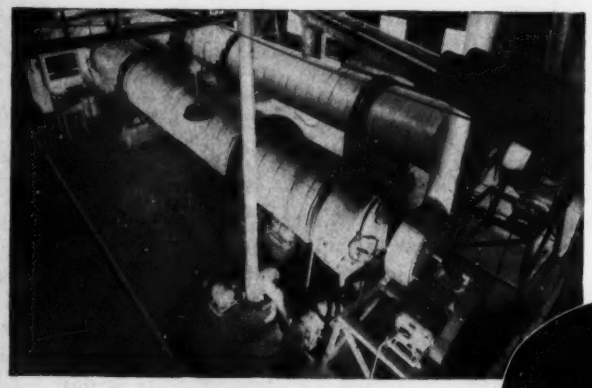
- **LOWEST IN COST per square foot of filtering area.**
- **VERSATILE—can be used on any filterable material, no matter how heavy, thick or viscous.**
- **RECOVER SOLIDS—reasonably dry, firm, easy to handle.**
- **CLARIFY perfectly, decolorize, deodorize, germproof.**
- **WASH OR EXTRACT, to recover or remove soluble contents. Steam, melt or redissolve cake.**
- **ANY CAPACITY, for any temperature and any pressure up to 1000 p.s.i.**
- **Made of any metal, wood, rubber, plastic for use with any filter media.**



*Corner feed, washing type, steam heated, stainless steel filter press.*

**T. SHRIVER & CO., Inc.** 846 Hamilton St. · Harrison, N. J.

When inquiring check CP 6147 on handy form, pgs. 2-3



**DIRECT FIRED DRYER**

**Two Direct Fired Dryers.**

If your product is not critical to high temperatures, you can dry it more economically in a Davenport Rotary flash or direct fired dryer. Let Davenport engineers assist you. Write for our complete catalog.

**DAVENPORT MACHINE and FOUNDRY COMPANY**
**DAVENPORT 4, IOWA**

**DAVENPORT**
De-watering Presses and Screens.

**ROTARY**
Steam Tube, Hot Air and Direct Fire Dryers.
Water Tube and Air Coolers.

**For quick reference see "Sweet's 1952 Processing Industries" file or "Chemical Engineering Catalog" — 1953.**

When inquiring check CP 6148 on handy form, pgs. 2-3

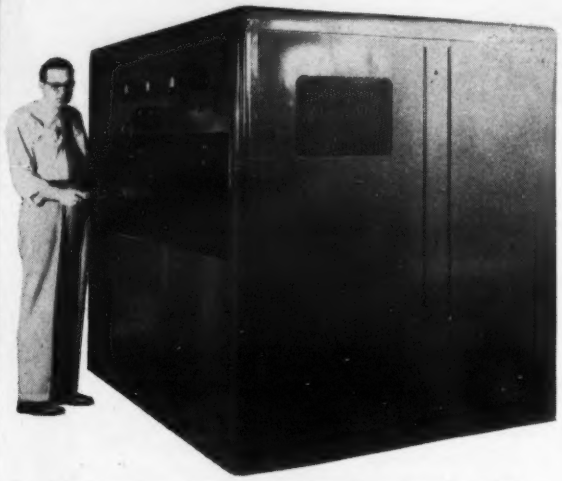
***50 kw at 400,000 cps provided by induction heating unit . . .***

built-in closed water system prevents overheating

*Uses*: Heating and fabricating operations which call for brazing, soldering, hardening, forging, shrink fitting, or similar processing.

*Features*: The Model LI-50A-1, an addition to manufacturer's line, provides more than 50 kw at 400,000 cps on a 100% duty cycle.

*Description*: High-frequency induction heating unit develops 2840 Btu per minute. Input, on 230, 460 or 550 volt, 3-phase, 60-cycle circuit, is 100 kva maximum (90% power factor), or 3 kva when idling. Unit measures 96" wide, 68" deep, and 80" high. It weighs 5400 pounds without accessories. The cabinet is made of heavy-gage steel to sturdily support and protect interior parts.



**High-frequency induction heating unit develops 2840 Btu per minute**

A built-in closed water system circulates controlled-temperature cooling water to the oscillator tube and tank coils. Average water consumption is 22.5 gpm at pressure of 20 to 80 psi.

(Made by Lindberg Engineering Company, Dept. CP, 2450 W. Hubbard St., Chicago 12, Ill. . . . or for more information check 6149 on handy form, pages 2 and 3.)

***Simple grid structure of tray ups still capacity, cuts costs . . .***

permits high flexibility in column design, minimizes pressure drop across tray

*Uses*: Vapor-liquid contacting tray for distillation columns. Tray shows greatest capacity advantage in columns having high liquid loads, as for example, de-ethanizers, depropanizers, stabilizers, absorbers.

*Features*: Trays have been found to have up to 100% greater capacity than well-designed bubble cap trays, about the same separation efficiency per foot of tower height, and as much as 80% less pressure drop per tray. In nearly all cases, the new tray's efficiency increases progressively up to the load point, whereas bubble tray efficiency drops off as the load point is approached. Pressure drop per

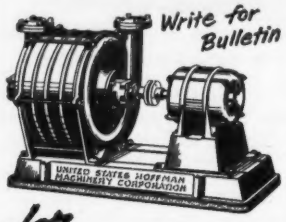
**When Your Process Demands**

**CLEAN DRY AIR or GAS**

**AT CONSTANT PRESSURE**

*Specify* **HOFFMAN**

**Multi-Stage CENTRIFUGAL BLOWERS and EXHAUSTERS**




*for*

- **AGITATION • AERATION**
- **OXIDATION • COMBUSTION**
- **GAS BOOSTING**
- **FILTERING • CONVEYING**

**With these Important Advantages**

- ★ Clean, Dry Delivery at Uniform Pressure
- ★ H. P. Input Adjusts Automatically to Volume Handled
- ★ No Internal Moving Parts
- ★ Long Life with Maximum Efficiency and Minimum Maintenance

*Our engineering staff will assist with your air or gas problems . . . compressed air costs very often can be materially reduced.*

● **HOFFMAN ALSO BUILDS HEAVY-DUTY INDUSTRIAL VACUUM CLEANING IN STATIONARY AND PORTABLE TYPES. *WRITE FOR BULLETINS.***

Air Appliance Division
**U. S. HOFFMAN MACHINERY CORP.**
113 FOURTH AVE., NEW YORK 3, N. Y.

When inquiring check CP 6150 on handy form, pgs. 2-3

theoretical tray does not increase sharply as maximum tray capacity is approached, as is the case with bubble trays.

The capacity advantages lead to savings up to 50% in installed cost of new column shells. For replacement service, the trays installed in an existing tower cost about half as much as bubble cap trays. Additional savings result from longer tray life, lower maintenance cost and time, and ease of control and operation. Of course, the most important advantage of replacing bubble cap trays with these new trays is the tremendous capacity gain resulting from the conversion.

Since the trays provide wide choice of efficiency, capacity, and pressure drop, it is possible to design for economic optimum installation by using, for example, highest capacity but somewhat less efficient trays in one case, lower capacity but highly efficient trays in another case, or trays giving high capacity and very low pressure drop per theoretical tray in still another case.

Other advantages are very low liquid residence time (making column easier to control), long tray life by use of corrosion resistant thin-gage alloy, and reduced tendency toward fouling, since there are no dead zones on the trays.

*Description*: "Turbogrid" trays (patent pending) are the result of a 20-year research program undertaken by Shell laboratories in this country and abroad. These grid trays are being installed in about 80% of Shell's new and replacement installations. Performance has been confirmed for 25 systems, both hydrocarbon and non-hydrocarbon, in experimental and plant towers, representing a pressure range from 5 to 300 psig, a vapor density range from 0.04 to 2.8 lb/cu ft, liquid-vapor density ratios from 10 to 1000, and vapor-liquid volume flow ratios from 10,000 to 5. No Turbogrid tray installation has failed to meet design capacity.

Trays are very simple in construction, consisting merely of a flat grating extending uniformly over the entire column cross-section. Openings in the grating are parallel slots of appropriate length, width, and number. The tray contains no bubble cap assemblies or liquid downcomers; both vapor and liquid flow uniformly through the slots. (Turbogrid trays are licensed by Shell Development Company, Dept. CP, 50 W. 50th St., New York 20, N. Y. . . . or for more information check CP 6151 on handy form, pages 2 and 3.)

### *Rubber parts in pumps have long life*

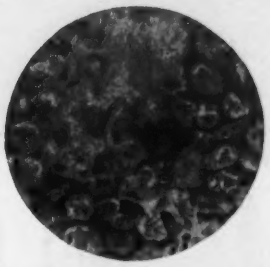
Twenty-page bulletin describes sand pumps incorporating rubber parts for increased durability. Features and construction of units are discussed. Annotated photographs and sectional drawings illustrate component parts of equipment. Exploded views are used to show construction highlights.

Detailed instructions are given for selection, installation, operation, and maintenance of pumps. Sectional views and related parts lists are included for all models in catalog. Engineering data for clearance and foundation dimensions, specific gravity of pulps, friction of water in pipes, capacities of various models of pumps, and motor selection are given.

Photographs and customer testimonials are used to indicate uses and performance of units. Bul No. P9-B8 is issued by Denver Equipment Co., Dept. CP, 1400 Seventeenth St., Denver 17, Colo. When inquiring specify CP 6152 on handy form, pages 2 and 3.


IN STORAGE . . . OR IN TRANSIT . . .





(ABOVE) Conventionally mixed material showing typical smears of unmixed materials. (BELOW) Simpson mixed material showing complete uniformity of mix—which will remain in that form even in transit, or after long storage periods.

SIMPSON MIXED MATERIALS STAY MIXED



*THIS you can depend on.* Once materials are mixed in a SIMPSON Mix-Muller *they stay mixed!* Even after prolonged storage . . . or bouncing around in transit . . . where *conventionally mixed* materials tend to *segregate* or *stratify* . . . Simpson-mixed materials retain their *constant stability.*

Segregation can occur only where materials have been improperly mixed . . . where individual grains have merely been placed *next to each other.* Contrast this to *mulling* in a Simpson Mix-Muller, where *each* grain is subjected to a kneading, smearing, mulling action which actually *blends* component materials into *one* . . . where blending is intimate, thorough and uniform.

In addition, SIMPSON Mix-Mullers require less labor, less horsepower, and are safer to operate. You can obtain more information from a National Engineer. *Write for details today.*



DO YOU REALLY KNOW WHAT MULLING IS?

Watch the practiced technique of a chemist's mortar and pestle — the intensive rubbing and smearing actions — and basically, *THAT'S MULLING!*

Mulling with a SIMPSON Mix-Muller utilizes a special pair of revolving mullers and plows mounted on a stationary pan. The mullers are adjustable and are supported by rocker arms. This leaves the mullers free to ride on the material creating a true mulling action as they revolve. The results are thorough, more accurate blending . . . unaffected by rough handling in transit, or in long storage periods.



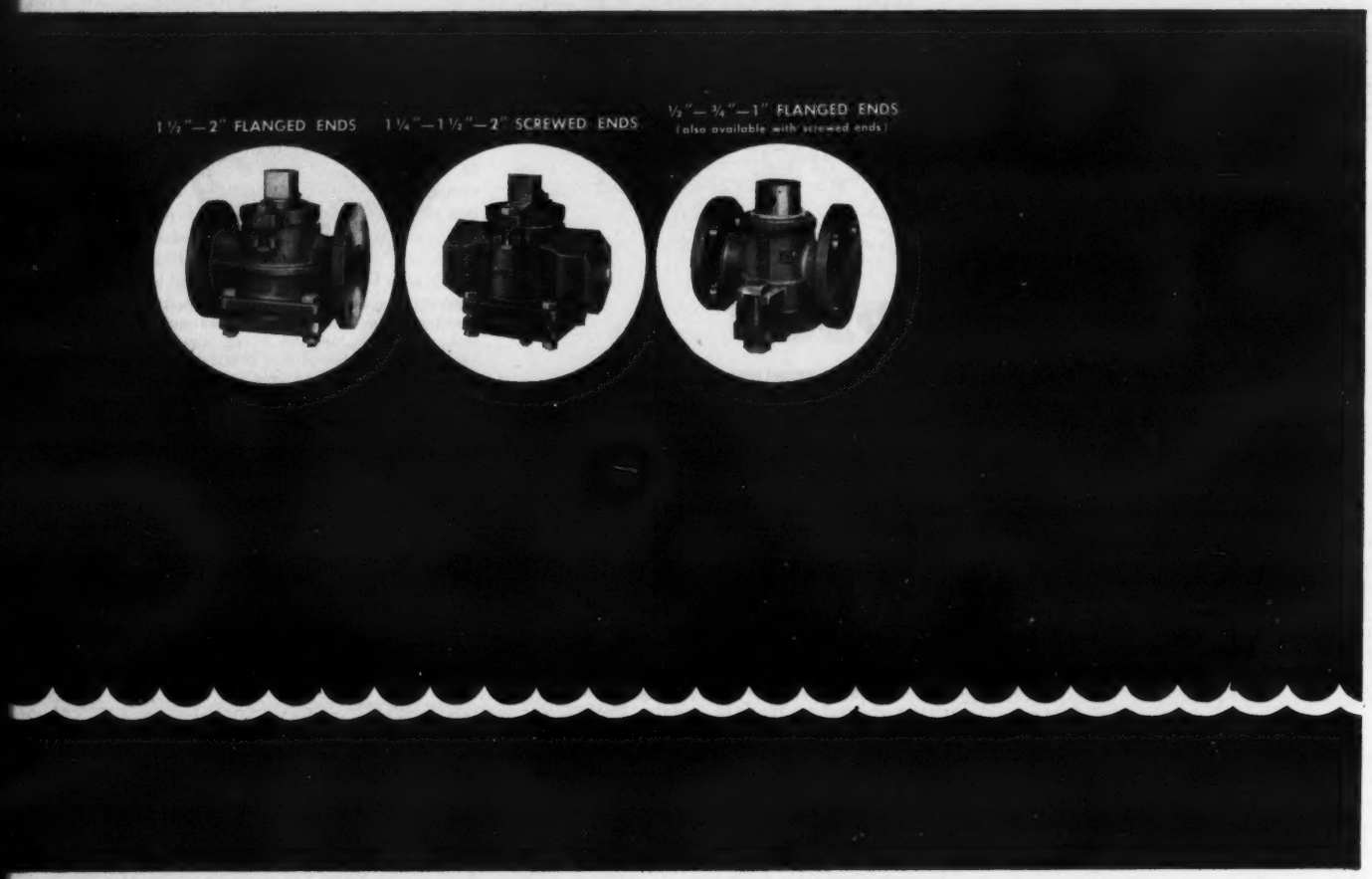
SIMPSON Mix-Muller® Division

NATIONAL ENGINEERING CO. . . . 404 Machinery Hall Bldg., Chicago 6, Ill.



When inquiring check CP 6153 on handy form, pgs. 2-3

# The Chemical Industry's best defense against corrosion




## DURCO Type F Valves with Teflon®* sleeves

In the two years since DURCO Type F Valves were introduced to the Chemical Industry, several thousand have been put into operation and the list of successful applications continues to grow.

DURCO engineers have designed a non-lubricated valve with no metal-to-metal contact, making use of a Teflon®* sleeve. This new design, in the correct DURCO alloy, provides you with a valve proven in actual service and operating with minimum maintenance costs.

*Full details in Bulletins V/4 and V/4a*

THE DURIRON COMPANY, Inc. DURCO CORROSION RESISTING ALLOYS & EQUIPMENT DAYTON 1, OHIO

**Registered trademark of E. I. duPont de Nemours & Co., Inc., for its tetrafluoroethylene resin.*



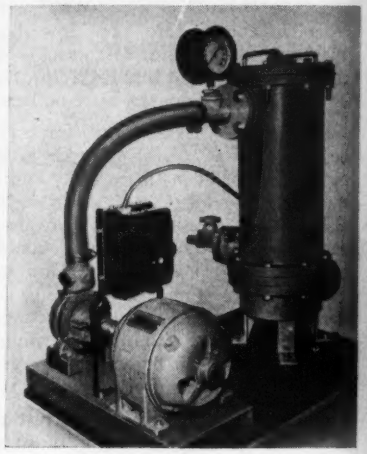

***Filters and pumps 1000—2500 gph, acid or alkali . . .***

motor automatically stops when filter's loaded with impurities

*Uses*: For pumping filtered acid or alkaline solution in pH range from 1 to 14.

*Features*: Filter pumps incorporate self priming turbine pumps, and automatic controls are set so that motor stops when filter assembly becomes loaded with impurities.

*Description*: Sethco models RLS-1200 and RLS-2400 have respective ratings of 1000-1500 gph and 2000-



2500 gph for filtering. Automatic controls include magnetic starter, stainless pressure switch, and stainless bourdon gage.

Pump and fittings are fabricated of stainless type 316. Filter assembly is rubber lined. Base is equipped with ball bearing, rubber covered casters to make unit portable. Filter Pumps are powered by drip-proof 220-440 v, 3 phase motors. Each unit is furnished with 15′ inlet and outlet chemical hose.

(Product of Sethco, Dept. CP, 70-78 Willoughby St., Brooklyn 1, N. Y.... or for more information check CP 6154 on handy form, pages 2 and 3.)

Be sure to see
CHLORINE DATA
a handy nomograph
on page 188

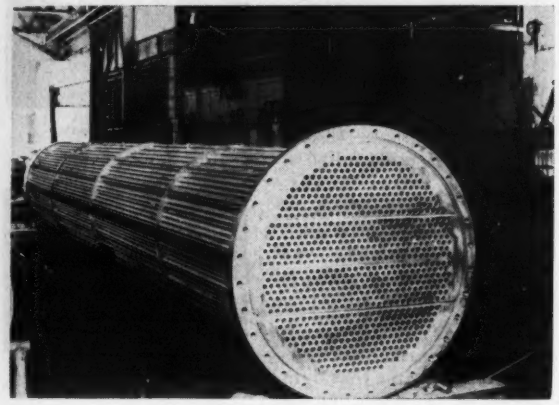
For more information on product at left, specify CP 6155 . . . see information request blank between pages 2-3.

### *Welded aluminum exchanger tube has 20% lower cost than seamless tube . . .*

has protective "alclad" coating inside and outside, instead of only on the inside surface

Now being produced are aluminum alloy heat exchanger tubes made by longitudinally butt welding sheet rather than by drawing seamless aluminum tubes. Cost is less for the butt welded tube. In addition, it has the protective "alclad" coating on both the inside and outside surfaces rather than on the inside only, as is the case with seamless aluminum tube.

The welded tube, made from Alclad 3S-H12 alloy, is available in two standard sizes at present: 1" wall thickness with either 0.049 or 0.065" wall thickness. Cost for these sizes is about 20% less than for seamless aluminum tube. In a few months it is expected that ¾" welded tube will be available.



Oil-to-oil heat exchanger tube bundle

Typical tensile strength for the welded tube is 17,000 psi, and yield strength 14,000 psi. Allowable internal working pressures generally average two-thirds those of seamless tube. Weight tolerances, tube expansion, hydrostatic pressure tests, and dimension tolerances (except for slight deviations in the weld area) are the same as for seamless tube. During manufacture, the outside weld bead is removed and the small inside weld bead is flattened.

Standard lengths are 12, 14, 16, and 20', but other lengths between 10 and 24' may be ordered.

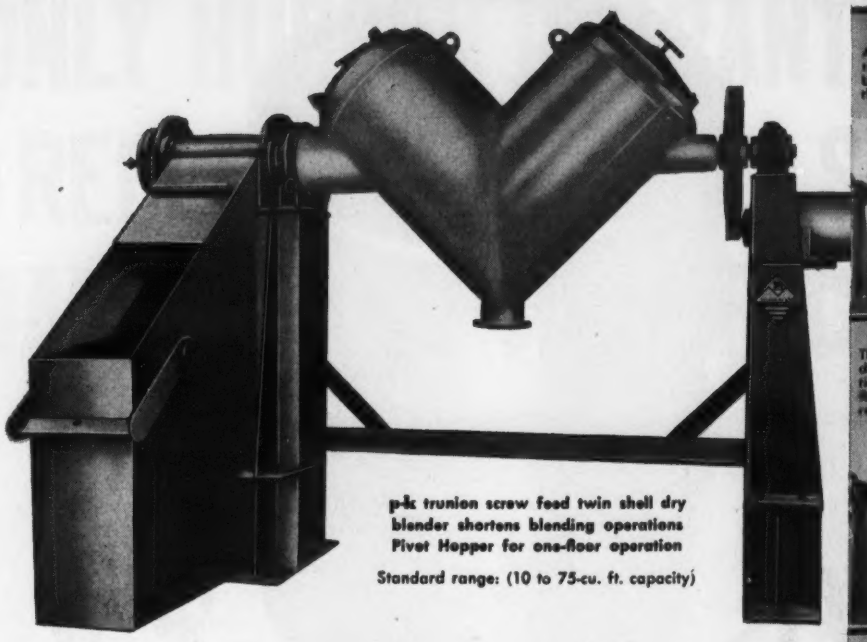
(Announced by Aluminum Company of America, Dept. CP, 801 Gulf Bldg., Pittsburgh 19, Pa. . . . or for more information check CP 6156 on handy form, pages 2 and 3.)

### *Flotation machine is designed for roughing, scavenging*

Designed for roughing and scavenger operations, especially with low-grade ores, the recently developed "Sub-A" Super Rougher flotation machine is now in quantity production.

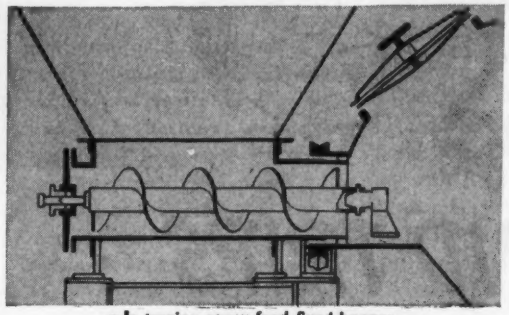
Features of the unit, an open-tank type, include: controlled feed to agitation chamber, highly efficient aeration, adjustable sand relief opening, controlled pulp level, low-level pulp overflow from both sides of machine, and double impellers on each shaft.

(Manufacturer is Denver Equipment Company, Dept. CP, 1400 17th St., Denver 17, Colo. . . . or for more information check CP 6157 on handy form, pages 2 and 3.)

p-k trunion screw feed twin shell dry blender shortens blending operations
Pivot Hopper for one-floor operation
Standard range: (10 to 75-cu. ft. capacity)

# Now! Dry blending is even faster



p-k trunion screw feed fixed hopper for conveyor or through-floor operation
Standard range: (10 to 150-cu. ft. capacity)

The new p-k trunion-feed, twin shell dry blender is faster because: Hopper can be loaded while blending is in progress permitting semi-continuous operation which speeds up the overall blending process. The blender is loaded directly from the hopper by a short, screw conveyor in a fraction of the time formerly required. All internal surfaces — shell, hopper and screw are quickly accessible for cleaning.

Gentle rolling-folding action assures rapid blending of powders, grains, pellets or flakes in any combination, thoroughly and without attrition.

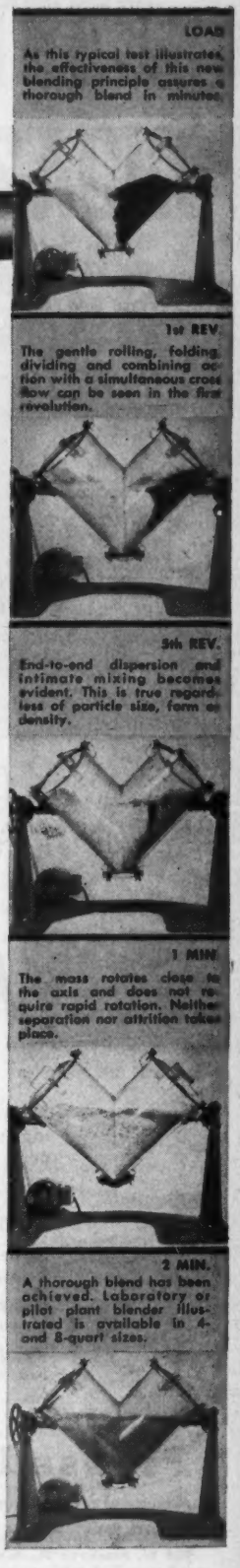
Dust tight loading ports eliminate dusting which results in a clean operation. All interior surfaces are baffle-free and are easily reached for thorough cleaning.

Simply designed for better blending.

When your process planning includes a blending operation, it will pay you to ask p-k for blending tests on your materials and for engineering assistance at the initial planning stage. Since p-k also makes double-cone and ribbon blenders, an unbiased analysis of your blending methods is assured. Or, write for factual literature—Catalog No. 12. ℗ 1901

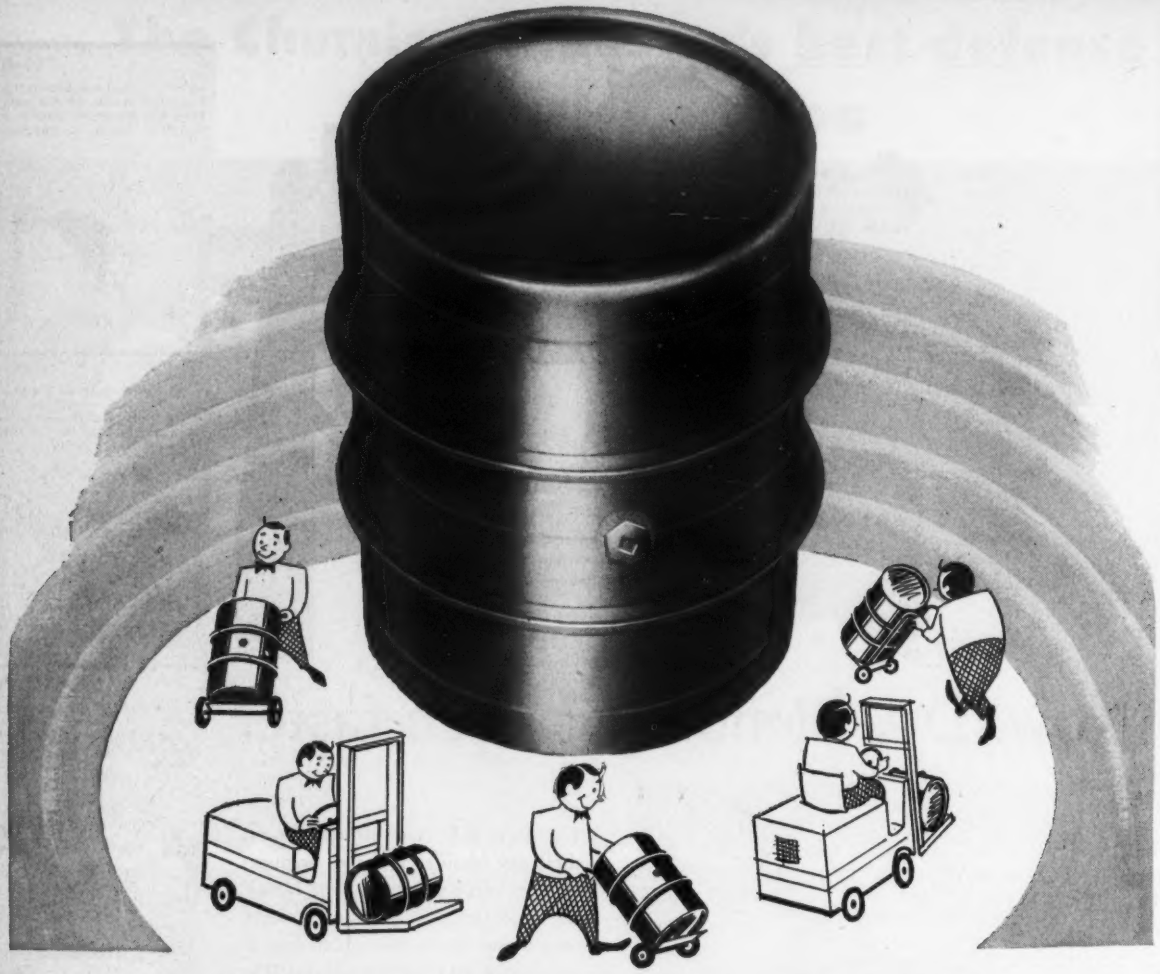
*the* **Patterson-Kelley Co.,** *Inc.*

810 Lackawanna Ave., East Stroudsburg, Penna.




101 Park Avenue, New York 17 • Railway Exchange Building, Chicago 4 • 1700 Walnut Street, Philadelphia 3 • 96-A Huntington Avenue, Boston 16 • and other principal cities

When inquiring check CP 6158 on handy form, pgs. 2-3



# MORE ROUND TRIPS

## ...with safety and savings

A Hackney 2-Piece Acid Drum will keep coming back for refills long after you would expect to retire a conventional 3-piece constructed container. That's because it is built stronger to last longer. Just look at these outstanding advantages, and see for yourself:

**I-Bar Rolling Hoops**—two 1" x 1½" hoops take the handling shocks—protect seam and bung from damage.

**Heavy Forged Spuds**—attached by a two-pass weld—minimize bung failures.

**Reinforced Chime Protectors**—add extra strength and life.

**Two-Piece Construction**—eliminates chime and longitudinal seams. Formed from two seamless, cold drawn shells, joined by a single circumferential weld.

**Controlled Heat-Treating**—relieves weld and forming stresses—increases resistance to corrosion.

**Smooth Interiors**—free from crevices, cracks and scale—are always easy to clean.

Choose Hackney 2-Piece Acid Drums for safe, low-cost shipments of sulphuric acid, aqua ammonia, caustic potash, hydrofluoric acid or other special chemicals. Write for full details.

*Write for a complimentary copy of our anniversary booklet, "Design for Progress."*

**Pressed Steel Tank Company**

*Manufacturer of Hackney Products*

1463 S. 66th Street, Milwaukee 14 • 1387 Vanderbilt Concourse Bldg., New York 17 • 235 Hanna Bldg., Cleveland 15
936 W. Peachtree St., N.W., Room 126, Atlanta 3 • 208 S. LaSalle St., Room 796, Chicago 4
568 Roosevelt Bldg., Los Angeles 17

Hackney MILWAUKEE

PRESSED STEEL TANK COMPANY 1903 1953 FIFTIETH ANNIVERSARY

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 6159 on handy form, pgs. 2-3


*Packaging*

# Looks at labels with electric eye to make sure that medicines are correctly marked

**Experimental unit inspects label in less than 1/1000 sec, can detect an undotted "i"**

MACHINE which has a photoelectric cell for its "eye" and a photographic negative of label as its "brain," is being used for automatic inspection of pharmaceutical labels. Although instrument is still in experimental stage, it has been used successfully in trial runs. Laboratory tests indicate that unit, which inspects a label in less than 1/1000 of a second, can detect an error as slight as an undotted "i".

Called a "scanner" by its inventors, machine operates on principle that light areas of a photographic print correspond with dark areas on the negative. If negative is exactly superimposed on print, whole thing will be dark. This is precisely how scanner works. As labeled bottle passes down production line in front of machine's eye, a negative is superimposed on label. If all light is cut out, label is accepted. Electronic circuits prevent machine from mistaking an unlabeled or mislabeled bottle for a correctly labeled one.

After relatively simple principle of machine was discovered, difficulty was encountered in developing method of trying negative in all possible positions to find out if it would exactly coincide with label. Problem was solved by splitting possible positions in two planes, horizontal and vertical. Horizontal movement of bottle on conveyor belt was already available. Vertical move-



Negative descends on print of label



When two coincide machine accepts label



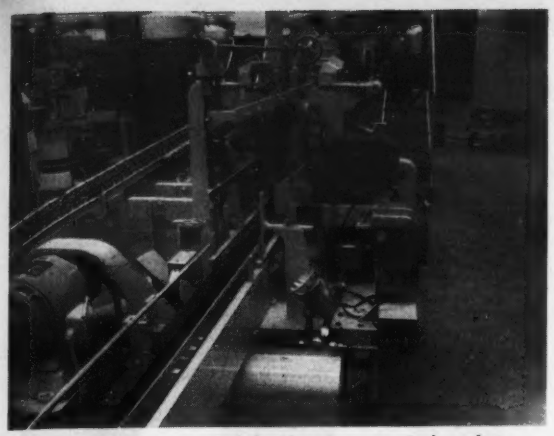
Negative continues its clockwise movement



Label is tried in different positions



Scanner looks at label in which letter "O" has been omitted



Label inspector mounted beside pharmaceutical packaging line is shown at right center

ment was attained by a spinning disk with 72 negative images passing in front of electric eye.

In present experimental set-up, machine stops entire packaging line after seeing a bad label. Scanner could ring a bell or even actuate a mechanism which would push offending bottle to one side. Since machine is still experimental, human inspectors still sit beside it and check its accuracy.

Mechanical label inspector was developed within company furnishing information for this article. Full patent protection is anticipated. While machine is a step forward in the manufacture of fine pharmaceuticals, it has potential valuable use in other industries. Principle conceivably might be applied to fast inspection of automobile parts or any number of other products.

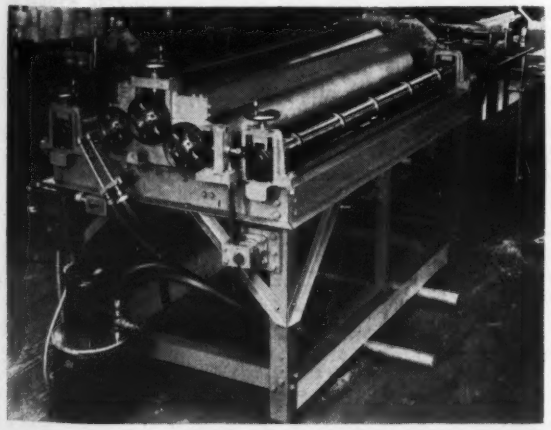
(Information obtained through courtesy of The Upjohn Company, Dept. CP, Kalamazoo, Mich.)

***Prints metal sheets at speeds up to 500' per min . . .***

machine quickly marks plates 0.01 to 1.5" in thickness and passes them to oiler

**Uses:** For printing or marking metal sheets.

**Features:** Machine will imprint at speeds up to about 500 fpm. It will imprint complete surface of any plate from 0.010 to 1.5" in thickness and up to 72" in length. After printing, plate is immediately passed to oiling machine. *(Continued on next page)*



For continuous printing of metal sheets

# ONLY HUDSON GUARANTEES TO REPLACE MULTIWALL SACKS DAMAGED ON YOUR PACKER

**Exceptional quality of Hudson Multiwall Sacks permits unusual guarantee**

PALATKA, FLA. Heretofore each Multiwall Sack user has individually absorbed the cost of any sacks which break on his filling and closing machines. But now, Hudson becomes the first and only Multiwall Sack manufacturer to guarantee to replace such broken sacks at no further cost.

According to experts, the average user of Multiwall Sacks normally expects to write off the loss of certain sacks during each day's run. These sacks are damaged due to circumstances beyond control of the Multiwall Sack manufacturer. Overloading of sacks, malfunction of packing or closing machines, or inattention on the part of the operatpr are some of the common causes of sack breakage.

Hudson is confident that the quality of the Multiwall Sacks they produce can eliminate most of this breakage. That is why they are willing to offer you complete protection through filling and closing operations. Only a company with a superior product would dare offer their customers such a guarantee.

**First in industry to offer this replacement guarantee**



T. H. Mittendorf

NEW YORK CITY. "Hudson is the first and only Multiwall Sack manufacturer to offer a written replacement guarantee on breakage of Multiwall Sacks," declared T. H. Mittendorf, Hudson's Vice President in Charge of Sales. "Hudson Multiwall Sacks lead the industry as being the world's most fully guaranteed. We believe they represent the best buy on today's market."



Hudson Representative, Harry Rafferty (center), points out the packing and closing operations covered by Hudson's new guarantee, to J. Dummett (left), Plant Supt. for Wedron Silica Company.

"Under the terms of our unusual guarantee the buyer is protected from the moment he accepts custody of the sacks until the sacks have successfully passed his filling and closing operations. This guarantee greatly extends our usual warranty of quality and workmanship," Mr. Mittendorf pointed out.

**Goes into immediate effect**

The new Hudson guarantee plan went into effect with all sacks purchased on or after Sept. 15, 1952. Early reports indicate that the guarantee is being enthusiastically received.

Prompt delivery on all contracts are assured by the tremendous capacity of Hudson's fully integrated mill at Palatka, Fla. High quality is maintained through inspection and controls at every step from tree to the finished Hudson Multiwall Sack. Hudson packaging engineers see that sacks conform to the exact needs of each user.

**Urge Multiwall Sack users to write for facts**

The Hudson Pulp & Paper Corp. invites all users of Multi...cks to learn how th...y by usi...wall ...tee ...cts ...y ...and ...y are promised!




Hudson Multiwall Sacks are available pasted or sewn, and in valve and open mouth styles.

Hudson Pulp & Paper Corp.
Dept. 212, 505 Park Ave., New York 22, N.Y.

When inquiring check CP 6160 on handy form, pgs. 2-3

(Continued from preceding page)

**Description:** Machine was designed and built to fit into production line of a sheet rolling mill. Quick drying aniline ink is used. Pinch rollers at infeed and eject end of machine pass sheet beneath printing system to oiler.

Handwheels provide and maintain very fine adjustments, not only for inking system, but also for pinch rollers to accommodate different thicknesses of sheets. Handwheel adjustment for 900-lb pivoted printing system for metal thickness is self-locking and effortless in function. Unit has an analox inking system, which transfers an adequate and continuous film of ink to printing drum. Rubber reservoir roller runs in a continuous bath of ink in contact with engraved analox metering roller. Ink recirculating pump and solvent replacing device are standard equipment with a reservoir or 7" channel with welded caps and ¼" pipe connection.

Printing drum is 72" wide by 22" in circumference and is made of aluminum. It is covered with rubber mat so that entire surface is available for type, rubber dies, or logotypes. Idler rollers support sheets across complete width of machine so that sag in thinner sheets will not affect operation of unit. Machine has ¾-hp variable speed motor to synchronize with surface speed of sheet.

Printer is substantially built of 6" channel, structural angle frame, and black iron castings. Approximate weight is 2 tons. Dimensions are 4' wide by 7½' long and 4½' high. All rotating parts are carried in double row roller or ball sealed bearings. Metal safety guards and all necessary controls are included. Machine described went to the Madison, Illinois plant of the Dow Chemical Co.

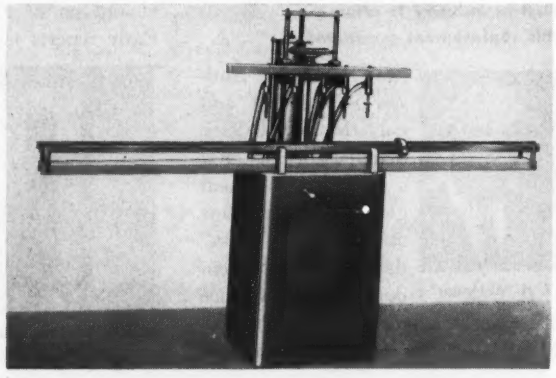
(Auto-Printer is product of The Industrial Marking Equipment Co. Inc., Dept. CP, 454 Baltic St., Brooklyn 17, N. Y. . . . or for more information check CP 6162 on handy form, pages 2 and 3.)

***Contamination is prevented by stainless steel parts of bottle filler . . .***

unit can handle from one ounce to one gallon size containers of glass, tin, or plastic

**Uses:** For filling of all types of free-flowing, viscous, and foamy liquids.

**Features:** Since all contact parts are of stainless



**Filling machine can be easily cleaned between runs**








**AUGER-MATIC**

*Bag Packer*

**Quickly fills self-closing bags to the desired weight. Saves time in filling and eliminates need for sewing or other expensive bag closing equipment.**

**The AUGER-MATIC Bag Packer has a multi-twist auger which can quickly be changed to pack any material from powder to pellets.**

**AUGER-MATIC Packing reduces dirt and waste . . . a time and labor saver. Packer can easily be moved from one filling point to another.**

***Send for descriptive literature.***

**E. D. CODDINGTON MFG. CO.**
5036 NORTH 12TH STREET • MILWAUKEE 9, WISCONSIN

When inquiring check CP 6161 on handy form, pgs. 2-3




**NILES**

***Lacquer-lined steel drums also offer you ECONOMY***

**The great strength, long life and economy of steel *plus* the chemical neutrality of NILES durable-finish, lacquer lining provide a combination in drums that means *maximum efficiency!* NILES lacquer linings are proof against chemical reactions of a wide range of materials. Where better, more economical storage and shipping are needed . . . turn to NILES for the solution.**

**NILES lacquer-lined steel drums are available with tight head or removable head. ALL Niles drums provide a liquid-tight seal indefinitely. It will pay to investigate their money-saving potentials for you. Write for details to—**

**NILES STEEL PRODUCTS DIVISION**
**REPUBLIC STEEL CORPORATION**
**462 Walnut St., Niles, Ohio**

**NILES**
REPUBLIC STEEL
**METAL BARRELS AND DRUMS**

When inquiring check CP 6163 on handy form, pgs. 2-3

steel, contamination is avoided during filling. Unit is adjustable to handle from one ounce to gallon size containers of glass, tin, or plastic.

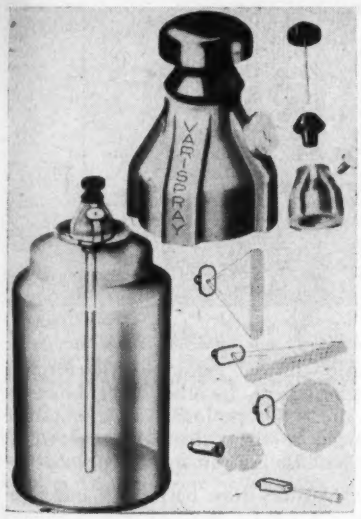
Description: Semi-automatic bottle filler can be supplied with 6 to 12 filling valves. Equipment includes 8′ adjustable guide track, vacuum pump, motor, and automatic overflow system. Fifteen gallon stainless steel supply tank is mounted at rear of unit and is equipped with float level-control valve. All contact parts are readily demountable for cleaning between production runs.

(Product of Lipac, Inc., Dept. CP, 475 Fifth Ave., New York 17, N. Y. . . . or for more information check CP 6164 on handy form, pages 2 and 3.)

***Interchangeability of spray head on aerosol products dispenser gives flexibility . . .***

eliminates need for packager to supply a spray head with each can

Interchangeability of spray head on valve dispensing unit for aerosol products results in savings through flexibility since need for packager to supply a spray head for each can is eliminated. Valve and spray head parts of unit are available separately. Another advantage of the Pressure-Pack valve unit is that the Varispray nozzle can be obtained in four types — thus permitting its use with a great number of products.




Valve dispensing unit and various spray patterns

Nozzle for paints, plastics, and similar surfacing materials adjusts to horizontal or vertical pattern—reported to increase coverage by 30%.

Another type of nozzle giving a small, round spray is intended for use with marking liquids and paints. Foam products are handled with a third type of nozzle while a standard unit dispenses cosmetics, insecticides, and pharmaceuticals. Both the inner and the spray head orifices are designed so that there will be a minimum of plugging.

Spray head can be removed, taken apart, and cleaned by consumer in five seconds allowing its reuse on other aerosol cans of the same or different products. Valve unit is both soldered and clinched to can cover for safety.

Can may be filled through valve if necessary. Filled cans do not require protective caps.

(Pressure-Pack valve unit is a product of Pressure-Pack, Inc. Department CP, Detroit 31, Michigan . . . or for more information check CP 6165 on handy form, pages 2 & 3.)




*the Percheron of Packaging*

...CHASE
MULTIWALL BAGS




Chase Multiwalls are "Built to TAKE it!" They're the work horse of packaging! They are easy to handle, stack, and palletize . . . easy to open and to empty. Furthermore, Chase Multiwall Bags are economical and sharply reproduce your brand name. Your Chase salesman is a thoroughly informed packaging expert. Check with him on Chase Multiwalls for the better packaging of your product.

*Percheron Horses are famous throughout Europe for great strength and symmetry of line.*

CHASE SINCE 1847 BAGS

Multiwall Bags for CHEMICALS

*for Better Bags...Better Buy Chase!*

CHASE BAG CO. GENERAL SALES OFFICES: 309 W. JACKSON BLVD., CHICAGO 6, ILL.

BOISE • DALLAS • TOLEDO • DENVER • DETROIT • MEMPHIS • BUFFALO • ST. LOUIS • NEW YORK • CLEVELAND • MILWAUKEE
PITTSBURGH • KANSAS CITY • LOS ANGELES • MINNEAPOLIS • GOSHEN, IND. • PHILADELPHIA • NEW ORLEANS • ORLANDO, FLA. • SALT LAKE CITY
OKLAHOMA CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS • CHAGRIN FALLS, O. • WORCESTER, MASS. • CROSSETT, ARK. • SAN FRANCISCO

When inquiring check CP 6166 on handy form, pgs. 2-3



**SAFETY FOR YOUR MEN...**
**VALUE FOR YOU**
**with**
**U. S. NEOPRENE GLOVES**

They help prevent costly accidents. • They withstand gasolines, oils, greases, and corrosive chemicals such as sulphuric, chromic, and muriatic acids, caustic and plating solutions. • The rough-surface fingers assure positive easy gripping. • They're comfortable because the curved finger construction conforms to the natural curve of hand, eliminates straining and pulling. Highly flexible, they permit easy, natural working motions. These "U. S." gloves withstand tough service. Full range of sizes, lengths and weights. "U. S." technical men will be glad to analyze your glove needs and recommend the correct glove for *your* job.

**U.S. INDUSTRIAL GLOVES**

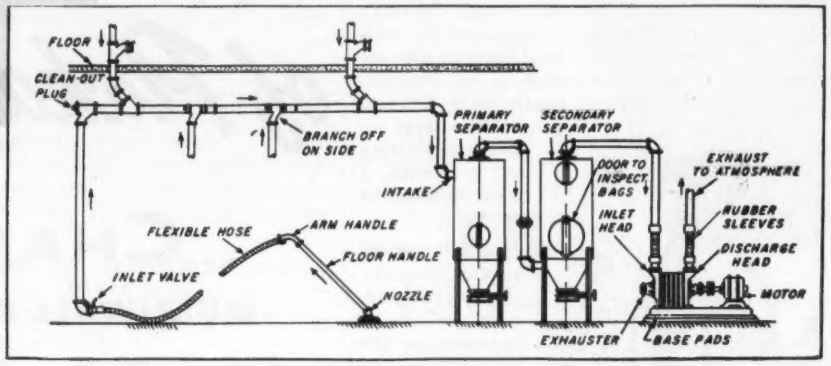
**UNITED STATES RUBBER COMPANY**

When inquiring check CP 6167 on handy form, pgs. 2-3


*Safety*

# Eliminates Explosion Hazards of Dusts and Fine Particles

**Multi-stage centrifugal exhausters remove spillage at 3000 fpm via vacuum hoses located at focal points**




Schematic diagram of typical Exidust system

MANAGERS in chemical process industries that use or produce combustible dusts or powdered materials can take a cue from ordnance and fireworks plants which pack or load explosives. They have developed a vacuum cleaning system which removes the spillage of combustible or explosive particles at a rate of 3000 fpm.

Set-up consists primarily of multi-stage centrifugal exhausters of the Billmyre type powered by explosion-proof motors (either Class II group G type for hazardous dusts or Class I group D type for hazardous gases). The explosive particles are drawn through black steel piping with flanged fittings and long turns to separators with aluminum dust buckets (non-sparking) or water sprays.

Rubber vacuum hoses with ground wires and static conducting rubber covers are used in short lengths at the various pick-up points. Hoses are fitted with ¾ or 1" fiber nozzles. Nozzles contain no valves which might spark and are shut down when not in use by placing a small square of hard rubber over the end. A typical installation may have as many as 30 to 40 nozzles and pick up 5-10 lb of explosive or hazardous particles per day.

In many operations it is desirable to have the operator handling the explosive or combustible material manipulate the pick-up nozzle with one hand while performing the operation with the other. In other cases, however, the process which sheds the explosive or combustible material is mechanized to the extent that permanent vacuum hoses may be installed at specific points.

The Billmyre-type exhausters draw between 8 and 9" of mercury column vacuum (about 125" of water column) — 30 times the negative pressure used in most simple dust collecting systems. Reason is that in vacuum cleaning of this type, the particles must be picked up from a static position on a surface — this requires considerably more energy and air velocity than to merely re-direct air-borne materials.

Both the installation and operating costs of such systems are sufficiently low so that they promise considerable safety improvement in many operations where immediate removal of particles is not absolutely mandatory. In the loading of molten explosive and pelletized detonating materials — such as TNT and Amatol — such systems are absolutely required.

(Exidust System was developed by Lamson Corp., Dept. CP, 303 Lamson St., Syracuse 1, N. Y. . . . or for more information check CP 6168 on handy form, pages 2 & 3.)

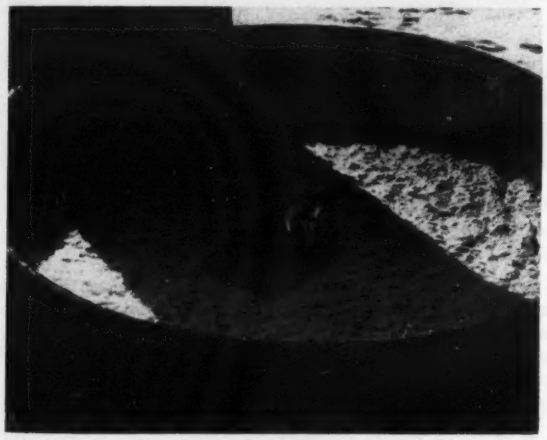
## Effective life of foam 50 times greater than that of similar products

**Substance possesses excellent adhesion, and clings well even to hot vertical surfaces**

USES: For combatting flammable liquid fires, such as those involving gasoline, benzene as well as in water soluble solvents.

Features: Its effective life is almost 50 times greater than that of other foams regarded as stable. It has complete resistance to breakdown by solvents. Adhesion is excellent as it clings well even to hot vertical surfaces.

Description: While half the water drains from what is considered a good foam in 10 minutes, the half-way drainage time for Alcohol Resistant Foam Compound is 12 hours. Compound is a protein-base material of the low-expansion, eight-to-one type. Recommended concentration is six parts of the compound to 94 parts of water.



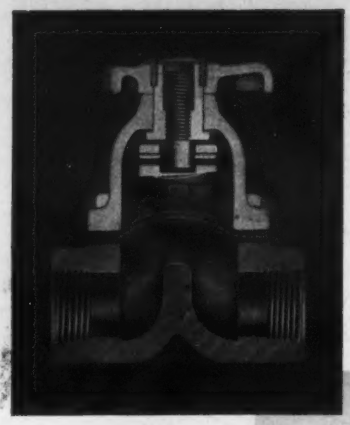
After a fire, when a square was cut from this blanket of alcohol-resistant foam and the unburned alcohol reignited, it could be seen along the edges of the cut-out that there was absolutely no injury caused to the foam by alcohol below

Foam has been used successfully in all tests required by Underwriters' Laboratories and UL approval for use on fires in all water soluble solvents, oils and other hydrocarbons is expected.

(Introduced by Pyrene Manufacturing Co., Dept. CP, 560 Belmont Ave., Newark 8, N. J. . . . or for more information check CP 6169 on handy form, pages 2 and 3.)

CALCULATING THE EFFECT OF CONDITIONS ON THE FREE ENERGY OF GASEOUS REACTIONS
in the
Processing and Engineering Data Section
on page 194

now!



diaphragm valves

. . . of chemical-resistant

ACE SARAN or PARIAN (Polyethylene)



Here's an all-purpose valve that combines the unique corrosion resistance of Ace plastics with the efficient Saunders diaphragm principle . . . a valve that cuts costs wherever corrosive liquids or gases are handled at normal temperatures and pressures.

Body is molded of Ace Saran or Parian. Diaphragm may be rubber, neoprene or polyethylene. Corrosives never touch metal. Bonnet assembly is sealed off from the solution. No stuffing box to leak. It can be serviced without removing from line—all parts are interchangeable. All sizes from ½ to 2 in., standard pipe threads. Working pressure 50 psi. at 77 deg. F.

Use Ace Saran and Parian pipe and fittings too, to make a completely protected system. You'll also be interested in the complete line of Ace hard rubber and rubber-lined chemical equipment. Write today for bulletins.

| REAGENT | ACE PARIAN RATING | ACE SARAN RATING |
|---|---|---|
| Sulfuric acid, conc. | Good | Good |
| Sulfuric acid, 60% | Good | Excellent |
| Sulfuric acid, 30% | Excellent | Excellent |
| Sulfuric acid, 10% | Excellent | Excellent |
| Hydrochloric acid, conc. (37%) | Good | Excellent |
| Hydrochloric acid, conc. (10%) | Good | Excellent |
| Nitric acid, conc. (70%) | Unsuitable | Good |
| Nitric acid, 10% | Fair | Excellent |
| Acetic acid, glacial | Unsuitable | Excellent |
| Acetic acid, 10% | Poor to Fair | Excellent |
| Hydrofluoric acid, 48% | Fair to Good | Excellent |
| Oleic acid, conc. | Unsuitable | Excellent |
| Sodium hydroxide, 50% | Good | Good |
| Sodium hydroxide, 10% | Good | Good |
| Ethyl alcohol (denatured) | Good | Excellent |
| Acetone | Good | Fair |
| Carbon tetrachloride | Unsuitable | Good |
| "Ethyl" gasoline | Unsuitable | Excellent |
| Benzene | Unsuitable | Fair |
| Xylene | Fair | Good |
| Lubricating Oil | Unsuitable | Excellent |
| Calcium chloride, 15% aq. | Excellent | Excellent |
| Calcium hypochlorite | Excellent | Excellent |
| "Duponol" ME, 10% aq. | Excellent | Excellent |
| Triethanolamine | Excellent | Good |
| Camphor Oil | Unsuitable | Excellent |
| Ferric sulfate, 15% aq. | Excellent | Good |
| Linseed Oil | Fair | Excellent |
| Formic acid | Good | |
| Saturated salt water | Excellent | Excellent |

● This is partial list only . . . ask for complete data.




ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 6170 on handy form, pgs. 2-3




# From time card to travel ticket

***Every angle completely covered . . . but one! When fire strikes during the night your skilled labor may go in the morning. The fully experienced Joes, Bills and Toms can't stand the financial strain of waiting . . . their time cards can become travel tickets to new jobs, while you're struggling to replace the ravages of fire.***

The threat of losing your skilled labor due to an unexpected fire tragedy can be fully eliminated. With C-O-TWO Smoke or Heat Fire Detecting Systems plus C-O-TWO High Pressure or Low Pressure Carbon Dioxide Type Fire Extinguishing Systems your plant can have fast, positive, round-the-clock fire watchman service simultaneously at each fire hazard point.

At locations where a deep-seated, smoldering internal fire as well as a fast burning external fire might occur, the smoke detector of a C-O-TWO Smoke Fire Detecting System, based on an exclusive operating principle, automatically detects the first trace of smoke, smoldering or fire.

For locations where excessive heat or combustion might cause a flash fire, the heat detectors of a C-O-TWO Heat Fire Detecting System automatically sound a warning at the first flash of fire.

Then clean, dry, non-conducting, non-damaging carbon dioxide is instantly released from either a C-O-TWO High Pressure or Low Pressure Carbon Dioxide Type Fire Extinguishing System into the threatened area. The fire is out in seconds with little if any interruption to operations and the carbon dioxide disappears without a trace . . . one of the safest fire extinguishing agents known . . . harmless to equipment, materials and finishes.

**WHEN BUSINESS STOPS . . . INCOME STOPS!**

Don't take chances with your investment. Secure the benefits of highly efficient fire protection engineering today . . . our extensive experience over the years is at your disposal without obligation. Get the facts now!

C-O-TWO

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

**C-O-TWO FIRE EQUIPMENT COMPANY**
NEWARK 1 • NEW JERSEY

C-O-TWO FIRE EQUIPMENT OF CANADA, LTD. • TORONTO 8 • ONTARIO

*Sales and Service in the Principal Cities of United States and Canada*

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

When inquiring check CP 6171 on handy form, pgs. 2-3


***One man can carry shield for fighting fires at close quarters . . .***

heat-stopping effectiveness due to glass fiber blanket fitted to framework

*Uses*: Enable firefighters to approach within a few feet of a fire with effective protection against radiant heat.

*Features*: Weighing only 26 pounds, shield can be carried by one man on the run over ditches or rough ground. At close quarters, fireman can either direct operations, turn off valves, effect a rescue, or fight the fire.

*Description*: Ability of the shield to protect against radiant heat is a blanket of Ultralite insulation fitted to a



framework of tubing. Ultralite is composed of long, fine textile-type glass fibers bonded together with a thermal-setting plastic resin.

User of the Ultralite Fire Shield maintains vision through a "peep hole" at eye level. His face is shielded by copper wire that disseminates and dissipates heat. A self-sealing opening for a hose nozzle may be cut through the shield wherever desired.

Two or three-man shields on wheels are also available.

(Product of Gustin-Bacon Manufacturing Company, Department CP, 210 West 10th Street, Kansas City 6, Missouri . . . or for more information check CP 6172 on handy form, pages 2 and 3.)

***Powerful, small-size fire truck negotiates narrow aisles and areaways . . .***

carries full complement of equipment and can be driven right up to fire site

A plant fire truck that can easily negotiate narrow factory aisles has been designed by plant protection officials of the Chevrolet Division of General Motors in Baltimore.

The designers, Chief of Plant Protection, Ray Wilder, and Chief of Fire Prevention, Walter Helm, equipped a Model C7-21 Clarktor mule with an Ansul S-150 dry chemical fire extinguisher unit behind the driver's seat. They also placed two Ansul 20-B hand extinguishers on each front fender.

Unit also carries a 20-foot extension ladder, an MSA Chemox breathing apparatus, rubber boots, rope, fire axes, siren, headlights, a portable searchlight, a 50-pound



Carries extension ladder, fire axes, fire extinguishers, rubber boots, breathing apparatus and portable searchlight

carbon dioxide cylinder and a small vaporizing liquid type extinguisher.

(Information courtesy of Ansul Chemical Co., 3300 Hegley St., Marinette, Wis.)

***Protects welders against hazards of fumes, gases, smokes . . .***

special gas mask has interchangeable dust-fume canister and a compressed air supply unit

*Uses*: Protection of welders under conditions where hazardous gases, smokes or fumes already exist or are produced by product residue, alloys, paints, or fluxes being vaporized by the flame or arc.

*Features*: Welding lenses (shades 4 to 12) are hinged over the regular lenses and open easily under spring control. Gas mask is provided with a dust and fume canister and a compressed air supply unit used interchangeably.

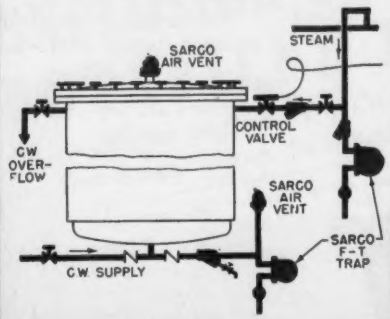
*Description*: Pur-A-Weld gas mask is designed to give welders gas-mask protection without in any way impairing their field of working vision. Mask may be worn by itself or in conjunction with a cotton duck or leather welding hood. If compressed air of suitable purity is available, its use is recommended. If not, and there is sufficient ventilation to provide 16% or more oxygen in the welding area, the canister may be used. Headaches, fatigue and breathing hazards can be reduced or eliminated through the face piece which provides manufacturer's Dead Air Check Valve and Inhalation-Exhalation Valve.

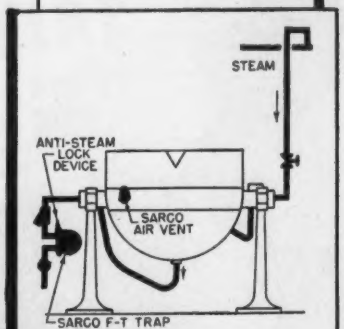


Shows canister equipped mask—unit for compressed air is also available

(Pur-A-Weld is manufactured by Acme Protection Equipment Co., Dept. CP, 3037 W. Lake St., Chicago 12, Ill. . . . or for more information check CP 6173 on handy form, pages 2 and 3.)

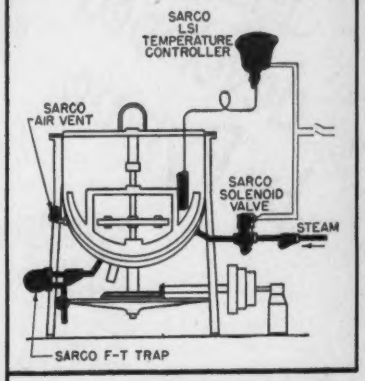

1 CANNING RETORT — down flow steam improves air venting. Draining and air venting automatically with Sarco equipment.




QUICK BOILING TILTING KETTLE — rapid air venting and draining with Sarco controls. 2

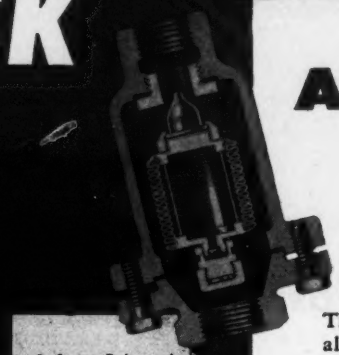
3 JACKETED MIXER — the Sarco Automatic System quickly removes air and condensate, holds the temperature constant.




quick

AIR VENTING

increases efficiency of process equipment



• Sarco Balanced Pressure Thermostatic Air Vent, type VS, sizes ⅜" to 1¼", pressures to 225 psi. Very large capacities.



• Sarco type VS Thermostatic Air Vents on ends of steam tubes of rotary drier.

• AIR in steam spaces cannot supply useful heat. The temperature of a mixture of air and steam is always lower than that of pure steam at the same pressure. So air in steam has the same effect as reducing the operating steam pressure.

Air and non-condensable gases in the steam space form an objectionable insulating film on the condensing surfaces. Such a film, only 1/1000" thick, can reduce the heat transfer rate by as much as 11%.

Quick and complete removal of air from steam heated equipment not only shortens warming-up time, it also improves surface temperatures, thus increasing production and reducing fuel consumption at the same time.

**Sarco Thermostatic Air Vents . . .**

are expressly designed to rid all types of process equipment of air and non-condensables and keep them that way.

When starting up, the large discharge valve is wide open, providing rapid and complete discharge of initial air. Air which collects during operation is discharged promptly, regardless of steam pressure or temperature.

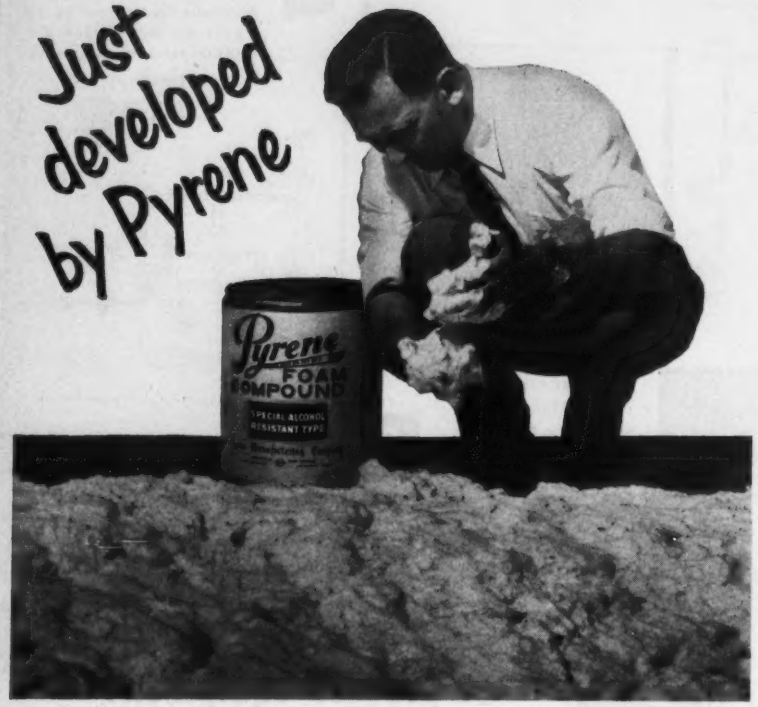
For full information on where and how to apply air vents to speed production and save fuel, write for Bulletin 275-4.

SARCO COMPANY, INC.
Empire State Bldg., New York 1, N. Y.
REPRESENTED IN PRINCIPAL CITIES
Sarco Canada Ltd., Toronto 8, Ont.

SARCO
improves product quality and output

411

When inquiring check CP 6174 on handy form, pgs. 2-3




## ...speediest, longest-lasting alcohol resistant foam ever produced!

Here at last is a really effective extinguishing agent for use against fires in water soluble solvents . . . Pyrene* Alcohol Resistant Foam (patent pending). This brand-new compound produces far and away the most stable foam ever known. Its effective life can be measured in *hours and days* instead of mere minutes. The blanket it provides stays on long after there is any chance of flames breaking out again. Actually, Pyrene Alcohol Resistant Foam is more than its name implies. It is really an *all-purpose* foam—effective against all flammable liquid fires—gasoline, oils, paints, alcohols, ketones, esters and ether. For complete information, write Pyrene.

*T.M. Reg. U.S. Pat. Off.

Pyrene AIR FOAM

**PYRENE MANUFACTURING COMPANY**
691 Belmont Ave., Newark 8, New Jersey
Affiliated with C-O-Two Fire Equipment Co.

When inquiring check CP 6175 on handy form, pgs. 2-3


***Pair of liquid-tight gloves supplement Army's air-tight suit . . .***

will protect wearer from germs and poison gas, and resist damage from oil, acid, caustic

Manufacturer's line of gloves are liquid-tight accessory developed for US Army Chemical Corps to supplement their air-tight suit. Gloves will protect wearer from poison gas and germs. They are made of impermeable compound which makes them resistant to damage from oils, acids, and caustics.

Gripping surface is fabricated to assure firm hold on wet or slippery objects.



Liquid-tight gloves are accessory to Army's air-tight suit

Stanzoil gloves are available in variety of weights and styles, according to specific application. Check list to guide selection of correct model may be obtained.

(Product of The Pioneer Rubber Company, Dept. CP, Willard, Ohio . . . or for more information check CP 6176 on handy form, pages 2 and 3.)

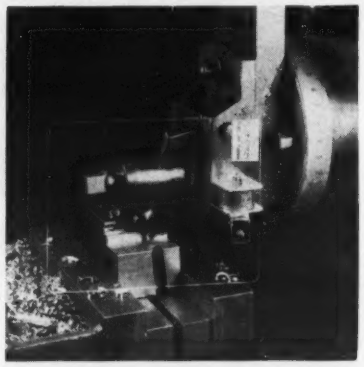
***Safety — your eyes have it when protected by plastic safety guard . . .***

magnetically positioned transparent panel allows user complete visibility of working area

*Uses*: Designed for use on lathes, presses, shapers, millers, grinders, boring mills, spot welders, and other machinery where personnel protection is needed due to unsafe conditions.

*Features*: Alnico permanent magnetic base allows plastic panel to be positioned for convenience of operator.

*Description*: The Magnetic Grip-Shield consists of powerful Alnico permanent magnetic base, two-way positioning arm, and "tru-vision" safe shield (components make-up the type B complete guard unit).



Shield attaches to machine by means of permanent magnetic base

Units are available in widths from 6 to 12" and heights from 8 to 16". All are 1/8" thick.

Plastic shields are interchangeable on same magnetic base. Unit attaches to machine by means of permanent magnetic base,


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and plastic shield positions by moving positioning arm to desired angle.

(Product of The Dilley Manufacturing Co., Department CP, 1656 Ansel Road, Cleveland 6, Ohio . . . or for more information check CP 6178 on handy form, pages 2 and 3.)

**No need to search high and wide . . .**

*for more information on something you read in these editorial articles. A letter to the company listed at the end of the article . . . or a mark on the Reader Service slip . . . will bring you what you want. This idea originated with CHEMICAL PROCESSING many years ago . . . to help busy men like you!*

THE EDITORS

### *Work gloves feature positive gripping action . . .*

will protect hands against impact and cutting as well as resist abrasive wear



Gloves are available in many sizes and styles

*Uses*: Gloves are manufactured in all sizes and styles for jobs requiring maximum protection for palms and fingers.

*Features*: Provide positive gripping action and long wearing qualities with maximum pliability.

*Decription*: Armor grip work gloves are made with closed, flexible metal zippers permanently bonded to fingers and palms in synthetic rubber. Complete line includes gloves, mittens, and palm guards.

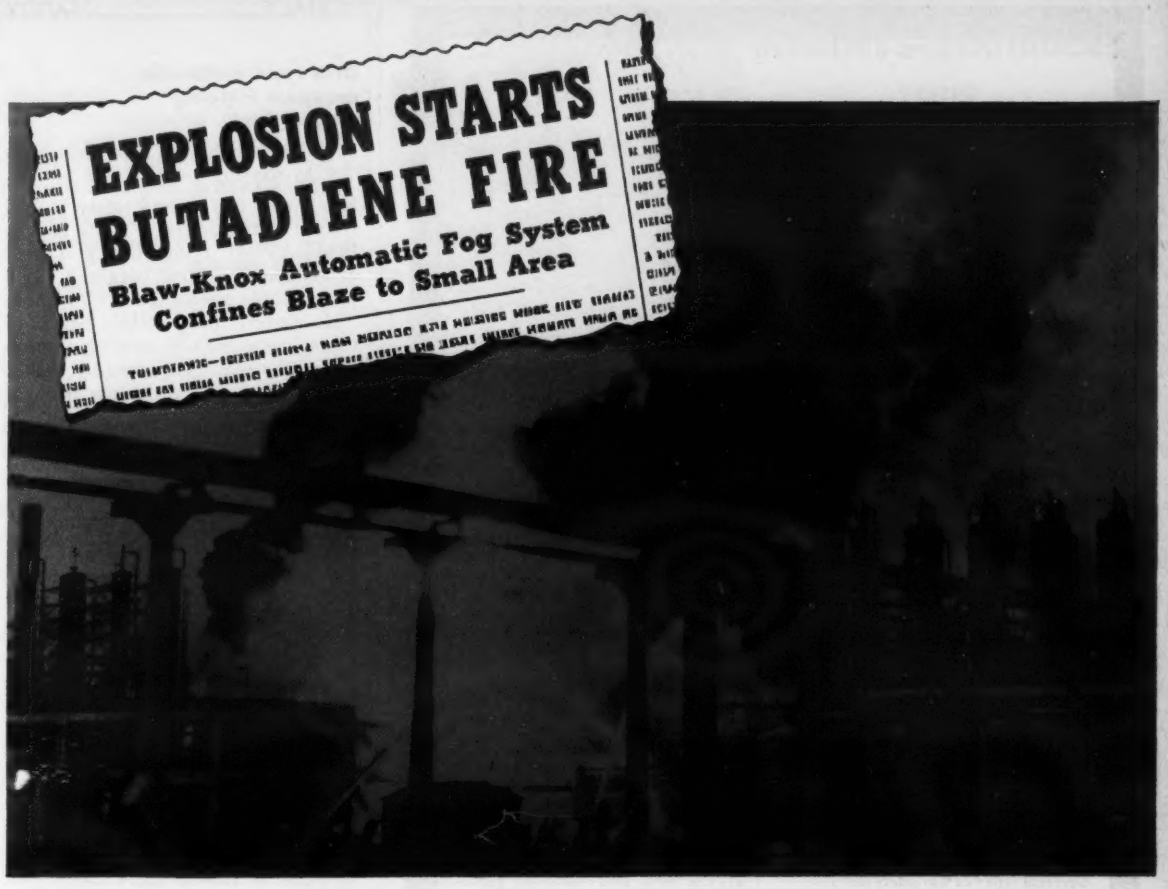
(Gloves are products of Surety Rubber Co., Dept. CP, Carrollton, Ohio . . . or for more information check CP 6179 on handy form, pages 2 and 3.)

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Conveniently indexed handbook contains pertinent data on every phase of industrial health and safety in 800-page volume. Hundreds of subjects covered have been systematically arranged and tabbed with identifying labels for easy reference. Material presented in easily read nontechnical language.

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To obtain "Industrial Safety and Health Handbook" remit $25.00 direct to The Manufacturers Directory Co., Dept. CP, 1240 Ontario St., Cleveland 13, Ohio. When inquiring specify CP 6180 on handy form, pages 2 and 3.


A serious fire, yes, but no "total loss"—thanks to the protection of adjacent equipment by smothering blankets of water from a

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Actuated by rate-of-rise thermostats, this system sounds an alarm and instantly throws a dense, quenching fog of water on the danger spot—either extinguishing or controlling the blaze while protecting adjacent equipment.

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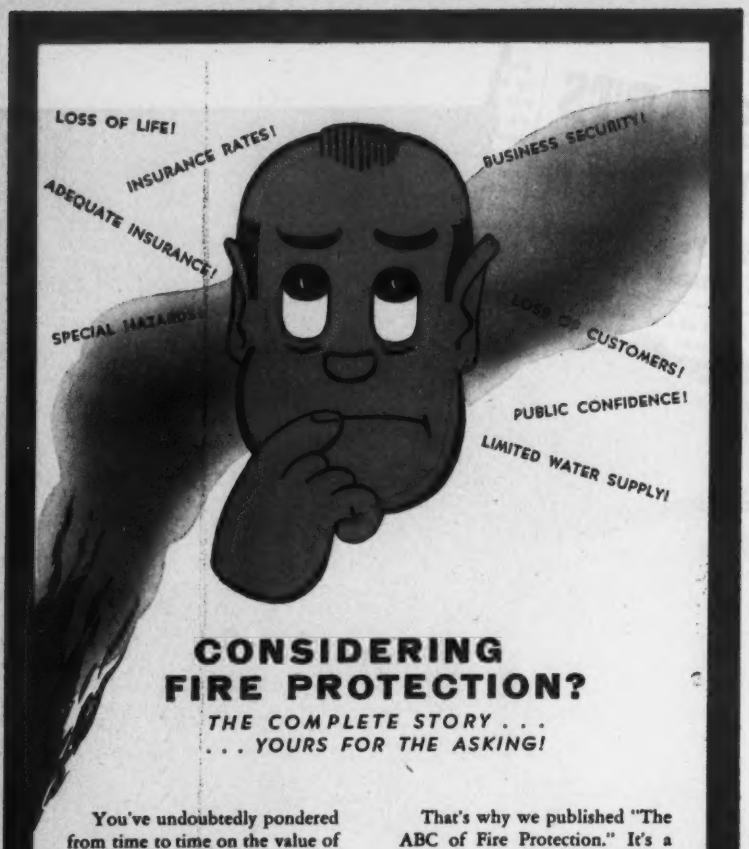
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*THE COMPLETE STORY . . .*
*. . . YOURS FOR THE ASKING!*

You've undoubtedly pondered from time to time on the value of fire protection. You've heard that certain types of fire safety can save you money . . . that sprinkler systems pay for themselves.

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FIRST IN FIRE PROTECTION

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***Grid type ventilation prevents fogging of goggles . . .***

light weight of 1.7 oz contributes to wearing comfort

Maximum comfort and safety is dual feature of plastic frame safety goggle. Pliable Vinyl frame has grid type ventilation to prevent fogging. Complete goggle weighs only 1.7 ounces. This factor, plus rolled edges of frame, contributes to wearing comfort of goggles.

Lens can be quickly changed, although locked into frame channel at seven different points. Lens and frame exceed federal specifications for impact resistance and strength. Saf-I-Flex goggle will fit over widest type personal glasses, and unobstructed frame assures full side vision.



Clear frame permits full side vision

(Product of United States Safety Service Company, Dept. CP, 1215 McGee, Kansas City 6, Mo. . . . or for more information check CP 6183 on handy form, pages 2 and 3.)

***Explains how to treat burns***

Two-color chart tells how, via three illustrated steps, to give first aid treatment for minor burns. "Burn Treatment" is issued by Chesebrough Manufacturing Co., Dept. CP, 17 State St., New York, N. Y. When inquiring specify CP 6184 on handy form, pages 2 and 3.

***Calendars provide way of teaching safety at home . . .***

safety consciousness can be fostered 'round the clock

A method of bringing safety into the employe's home is the safety calendar offered by the National Safety Council. These calendars carry safety tips and lessons and provide a means for making safety programs 'round the clock affairs.

A colorful poster is provided which contains an offer to employes of


**TRI-LOK safety steps**



*"A STRONG STEP TO SAFETY"*

Each Tri-Lok step consists of a panel of Rectangular, Diagonal, or U-type Tri-Lok flooring in any desired width, length, depth, and bar spacing.

**SAFE**—checker plate nosing bars make each step stand out clearly. Abrasive edging also available.

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● Benjamin "Vapolets" are recommended for all locations exposed to moisture and non-combustible dust, such as processing areas, loading docks, power plants, R.R. shops, cold storage plants, etc. Listed "Vapor-Proof" by UL.

Sealed lamp and wiring chambers; rugged aluminum guards; porcelain enameled steel reflectors (optional) assure long life without breakdown or frequent service.

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**Brady Safety Signs are made of durable cotton cloth, Silicone Coated to resist dirt, grime and moisture. CONFORM TO ASA Standard Z35.1-41. Select your requirements from a complete catalog of standard safety messages. Cost only a few cents per sign. Immediate delivery. Specials made to order.**

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- injury claims decrease
- work goes faster, production increases

*—all at lower per hour glove cost to your plant!*

Long-wearing liquid-tight neoprene Stanzoil industrial gloves resist damage from acids, oils, solvents, caustics. 32 styles, weights, sizes, colors. New PIONEER catalog shows you *at a glance* how to select the most efficient and economical gloves for each operation. It pays you to write for your copy today.

*N-36 medium weight all neoprene glove, 11" length. Snug curved fingers, non-slip grip surface afford almost bare-hand dexterity.*

*Industrial Products Division*

The PIONEER Rubber Co.

241 Tiffin Road • Willard, Ohio

Quality Gloves for Over 30 Years

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a "Free 1953 National Safety Calendar." Along with this it is suggested that either individual request forms to fill out be provided or a simple list to sign, headed, "Yes, I want a Free 1953 National Safety Calendar."

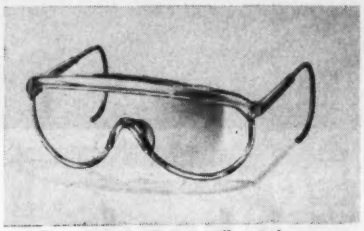
(Poster plus order blank for calendars may be obtained from National Safety Council, Dept. CP, 424 N. Michigan Ave., Chicago 11, Ill.)

### *Safety goggle provides greater vision . . .*

transparent plastic frame permits wider view

Safety goggle is announced with frame of transparent plastic. This eliminates feeling of having blinders on and enables wearer to see better in all directions.

Goggle can be worn directly over eyes or over spectacles. It is particularly useful for frontal protection from foreign particles from machine work, grinding, chipping, and certain laboratory operations.



Transparent frame allows larger field of vision

(Product of American Optical Company, Dept. CP, Southbridge, Mass. . . . or for more information check CP 6189 on handy form, pages 2-3.)

### *Hydraulic and hand tools increase job safety*

Complete line of hydraulic and hand tools which feature increased efficiency and job safety are described in 64-page booklet. Production, construction, maintenance, and other problems are discussed. Photos and brief descriptions indicate applications of products. Equipment listed includes remotely controlled hydraulic jacks, gage-equipped and standard jacks, pipe benders, knock-out punches, hydraulic pumps, torque indicators, and hand tools. Drawings show use of attachments available for use with tools.

"Idea Book" is issued by Blackhawk Manufacturing Co., Dept. CP, Milwaukee 1, Wis. When inquiring specify CP 6190 on handy form, pages 2 and 3.


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Send for File No. 901. You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped systems and Ansul 2000 lb. Stationary Units.



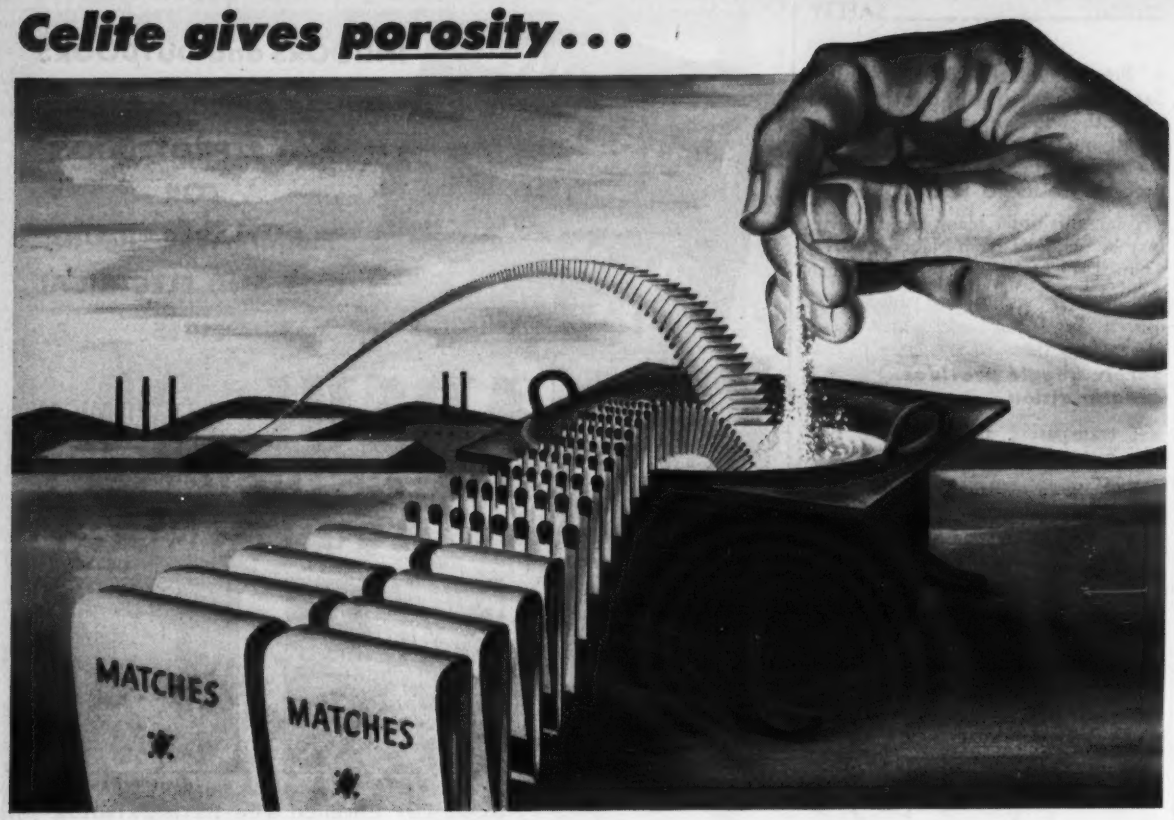
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## Celite gives porosity...




# Adding "Safety Valves" to match heads

Incorporated in match heads, Celite Mineral Fillers act as "safety valves" to prevent flare-up and kill afterglow.

The explanation: *Celite's porous, thin-walled, cellular structure gives the match heads greater porosity so that gas can escape quickly.*

Celite's abrasive quality also makes matches easier to strike. And from a production line standpoint, the high absorptive capacity of this mineral filler speeds drying of the match heads . . . while its light weight and great bulk improve dispersion of the active chemicals in the match head mix.

These and other unusual physical characteristics adapt Celite Mineral Fillers to numerous industrial uses.

**THESE CELITE PROPERTIES BENEFIT MANY TYPES OF PRODUCTS**

Celite's minute, chemically inert particles have an irregular, spiny structure—which accounts for their efficiency as a delicate abrasive in polishes, as a flatting agent in paints, varnishes and lacquers, and as a reinforcing agent for paint films and rubber products.

Celite powders can absorb up to three times their own weight of liquid—making them particularly useful in preventing ammonium nitrate crystals from caking, in absorbing liquid insecticide poisons, and in controlling pitch trouble at paper mills. And because the loose weight of Celite averages only 10 pounds per cubic foot—these mineral fillers are employed to fluff-up insecticide dusts and household cleansers, as well as to extend white pigments in paper manufacture.

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- More Durable Finish
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- Elimination of Caking
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- Better Dry Mixing
- Improved Dispersion
- Greater Porosity

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**Johns-Manville CELITE®**

**MINERAL FILLERS**

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## Briefs . . .

### Citric acid esters as plasticizers

Authors discuss advantages of several citric acid esters used as plasticizers. Chemical and physical properties of each are tabulated as well as properties of some formulations in which they were used. Toxicity tests are commented on. Consideration covers use in cellulosics and polyvinyl polymers. 3 pages, 3 tables. (*"Modern Plastics," October* 1952, *page* 134.)

### Lactic acid from dextrose

Cooperative report gives historical survey of the lactic acid industry and natural materials from which it may be produced. Description of a process used by American Maize Products Co. and flow sheets are included for lactic acid and for calcium lactate alone. (Both materials are produced for market.) Cost breakdown is given. Major uses commented on. 12 pages, 4 figures, 3 tables, 11 photos. (*"Industrial and Engineering Chemistry," September* 1952, *page* 1955.)

### Overhead conveyor lubrication

Procedures recommended for conveyors in continuous operation. Tells troubles arising from faulty lubrication, specifies how and where to lubricate. Comments on special problems arising when conveyors pass through areas of heat, cold, or excessive moisture. 3 pages, 8 photos. (*"Flow," August* 1952, *page* 64)

### Recovering organic insecticides from sprayed, dusted crops

Authors describe methods used in recovering six common organic insecticides from field crops. Tests used in estimating quantities recovered are given. Conditions during, elapsed time from spraying until examination for residuals are stated. Results are tabulated. 4 pages, 6 tables. (*"Journal of Economic Entomology," June* 1952, *p.* 428)

### Hydrolysis of wood

Various processes for the production of sugars by wood hydrolysis are reviewed and specific description of a process devised by A. Hereng is presented. This process is claimed to have several advantages over processes hitherto tried. 8 pages, 5 figures, 2 tables. (*"Chemie et Industrie," May* 1952, *page* 753.)

### Practical aspects of liquid mixing and agitation

Reference is made to difficulties in using a purely theoretical approach to determination of design details and horsepower for stirring equipment. A general classification of the distinctive types of mixing problems is made according to the flow properties and viscosity of the materials being mixed.

**Here's a quick look at interesting articles, appearing in other publications . . . as selected by Technical Editor, H. McCormack**

Some typical flow patterns are illustrated. Suggestions are made as to relating agitator design to vessel shape. 14 pages, 16 figures. Includes 4 pages of discussion. (*"Trans. Institution of Chemical Engineers,"* [*London*], *Volume* 29 — 1951, *page* 301.)

### *Heptachlor: its properties and effectiveness*

Typical properties of technical heptachlor are tabulated. Compatability with other insecticides stated along with types of formulation. Extended list of pests controlled by heptachlor and suggested concentrations accompany listing. 3 pages, 2 tables. (*"Agricultural Chemicals," September* 1952, *page* 35.)

### *Synthetic Fibers*

Much of the information now known about synthetic fibers is presented in this symposium. Items specifically covered are: fiber properties, production factors, uses for the newer fibers, and impact on established fibers. 83 pages. (*"Industrial and Engineering Chemistry," September* 1952, *page* 2101.)

### *Brightening eucalypt ground wood*

An Australian chemist describes a process for securing a more satisfactory color of eucalyptus ground wood by addition of zinc hydrosulfite. Technique is described and results are stated. 3 pages, 3 figures. (*"Paper Trade Journal," September* 12, 1952, *page* 26.)

### *Design and performance of cyclone separators*

General mechanism of operation of cyclone dust collectors is described, and performance data for some practical designs are presented. Main factors affecting the efficiency of cyclones are discussed, and experimental data presented to validate views expressed as to most efficient design. A recommended testing technique is appended. 26 pages, 27 figures, 5 tables. Includes 9 pages discussion. (*"Trans. Institution of Chemical Engineers,"* [*London*], *Volume* 29 — 1951, *page* 357.)

### *Mixing of coal with liquids*

Various problems of mixing coals and oils for such purposes as combustion, briquetting, carbonization, hydrogenation, and allaying coal dust are considered. Techniques employed with different objectives in mind are discussed. 11 pages. (*"Trans. Institution of Chemical Engineers,* [*London*], *Volume* 29 — 1951, *page* 290.)


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**stuffing box stops all leakage on suction heads up to 15 feet**

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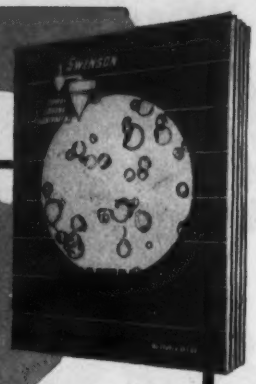
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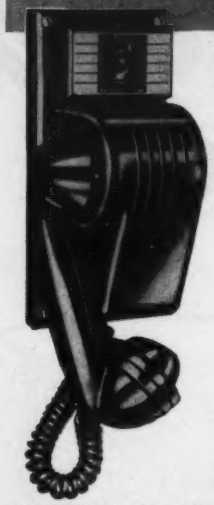
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### Oil content of soya beans — a rapid dielectric method

Authors state essential conditions for developing a method to determine oil content from dielectric constant. They describe necessary equipment, procedure, calculations and compare determinations made in this way with those made by customary, Soxhlet extraction. Time per sample is about 15 minutes. 3 pages, 5 figures. (*"Journal of American Oil Chemists' Society," July* 1952, *page* 258.)

### Chemical plant maintenance

Author describes the studies and resultant procedures which materially reduced maintenance costs in a large, diversified chemical processing plant. Calls attention to non-productive time and tells how much of this was eliminated. 5 pages, 4 figures, 1 table. (*"Chemical Engineering," August* 1952, *page* 167)

### Unit process review

One hundred thirty three pages allocated to this 5th Annual Review. Extended bibliographies accompany each process reviewed. (*"Industrial and Engineering Chemistry," September* 1952, *page* 1967.)

### Corrosion resisting characteristics of iron modified 90:10 cupro nickel alloy

Objective of research was to ascertain corrosion resistance properties of this alloy and to evaluate it for such purposes as had hitherto required an alloy of higher nickel content. Tests covered a wide variety of conditions of service and testing methods. 19 pages, 14 tables, 39 figures. (*"Corrosion," August* 1952, *page* 259)

### Measurement of foam consistency

Authors discuss and describe a method developed and applied in measuring foam consistency of detergent solutions. Instrument construction and operation described. Preparation of foam, its measurement and the foam drainage measurement are also reviewed. Factors modifying measurements are discussed with examples. 5 pages, 7 tables, 10 figures. (*"Journal of the American Oil Chemists' Society," September* 1952, *page* 386.)

### Detecting need for repair and adjustment on fork trucks

Chief engineer of a firm manufacturing trucks tells how to detect need for repair and adjustment of fork trucks and states the equipment and facilities needed for testing. Tells the tests which should be made and how to make them. 5 pages, 2 figures, 2 photos. (*"Flow," October* 1952, *page* 55.)

### Corrosion testing: A tool of conservation

Author states that laboratory corrosion data "developed for various alloy compositions under specific solution conditions, designed to parallel those of a particular plant operation are frequently found unreliable." Sources from

which author believes reliable data may be obtained are listed and commented on. Care necessary in selecting specimens and mounting them for tests is stressed. Specific technique used to obtain data included in paper is stated. 4 pages, 3 figures, 5 tables. (*"Chemical Engineering Progress," August* 1952, *page* 377)

### Action of free jets in the mixing of fluids

Author presents theoretical discussion of hydraulics involved in the type of jet mixer used. Some examples compare actual mixing time with mixing time as calculated by the method presented. Results compared to a propeller agitator. Comments on influence of tank shape. 10 pages, 11 figures. (*"Trans. Institution of Chemical Engineers," [London]*, Vol 29 — 1951, *page* 323.)

### Industrial fat splitting

Author says "investigation on fat hydrolysis in the last ten years agrees upon a homogeneous hydrolysis in the oil phase — is of general value since it is applicable with the same efficacy to the different industrial splitting processes." Induction period and influencing factors are discussed as are effects of stirring and effects of ratio of glycerol water to free fatty acids. Kinetics of the splitting reaction commented on. 4 pages, 3 tables, 1 figure. (*"Journal of the American Oil Chemists' Society," September* 1952, *page* 362.)

### The biological treatment of industrial wastes

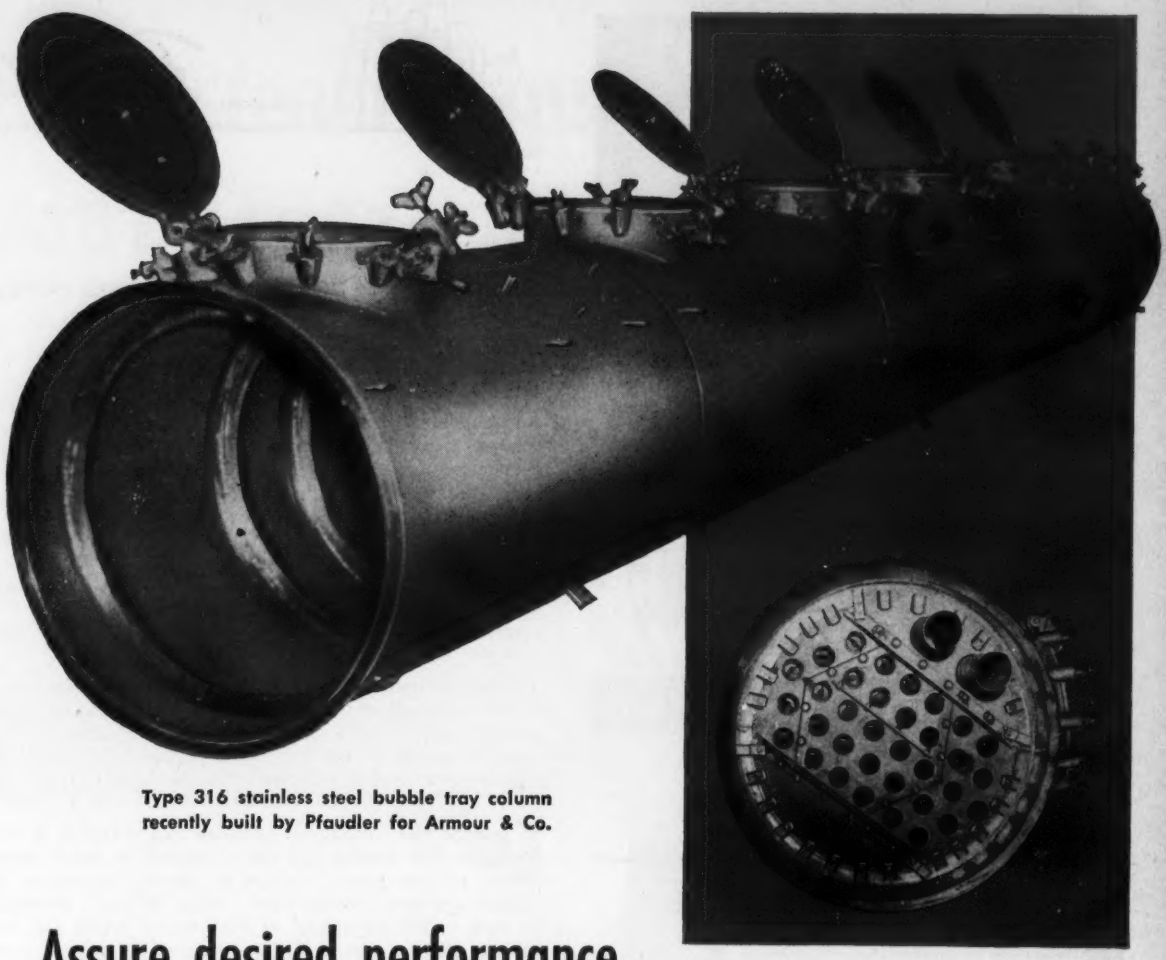
Authors discuss factors of biological oxidation in industrial wastes: state those things occurring in some wastes which may modify or inhibit customary processes. Examples are included of waste treatment for waters from anti-biotics, beet sugar, canning of vegetables, dairy, brewery, distillery and yeast, packing house, paper and pulp, phenolic and formaldehyde wastes and those from textile and wool dyeing. 5 pages, 3 photos. (*"Chemical Engineering Progress," September* 1952, *page* 449.)

### Furfuryl alcohol as a resin former

Methods used in producing resins of this type are presented and discussed. Physical properties and chemical resistance of one are tabulated in comparison with customary phenol-formaldehyde type. Some rather unusual uses of the resin, with various fillers on methods of reinforcing are cited. 4 pages, 5 photos, 2 tables. (*"Modern Plastics," October* 1952, *page* 127.)

### A liquid-Dowtherm heating and cooling unit

Authors describe an installation used in pilot plant operations over a temperature range of 125 to 650°F. Reaction temperatures can be controlled at point of use by blending a stream of hot with a stream of cold Dowtherm A. Centrifugal pumps provide forced circulation. Three years operating experience has demonstrated that temperatures in the range 200 to 550°F can be maintained to within one per cent. 4 pages, 3 figures, 2 tables. (*"Chemical Engineering Progress," August* 1952, *page* 409)

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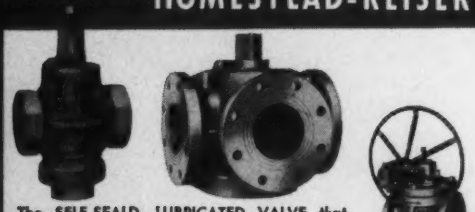
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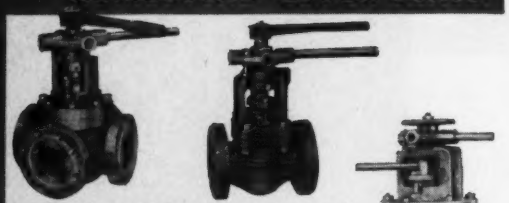
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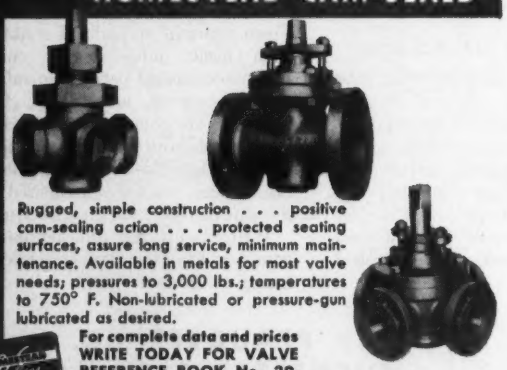
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# Recent Books

## TECHNOLOGY of COATED and PROCESSED PAPERS

*Reviewed by C. A. Southwick, Technical Director*
*H. P. Smith Paper Co.*
*Chicago, Ill.*

*"Technology of Coated and Processed Papers"* is the second volume by Mr. Mosher on the general subject of specialty papers. First volume, "Specialty Papers — Their Properties and Applications", was published in 1950. Both volumes are actually collected monographs by many specialists under the editorship of Mr. Mosher, who is also a major contributor. It is the intent of the present volume "to cover the general types of operations involved in the converting of paper, the equipment used in converting operations, and the methods of evaluating the products from the angle of the technical man, the engineer and chemist."

The introduction by Mr. Mosher, is a masterly condensation of the transition of this industry from a crafts to an engineering basis. Each monograph covers important and separate phases of the materials, processes and machines that are now used in the production of the many types of paper produced by this industry.

In general, the coverage is excellent except that it is unfortunate that waxing and waxed papers are barely mentioned and no space is given to present techniques of directly applying thermo plastic resins as paper coatings. In view of the importance of both waxed papers and the rapidly growing number of papers coated by thermal resin processes, this omission appears to be a glaring one. Certainly, some mention should have been given to both, even though the intent of the book appears to be directed towards printing and decorative papers.

Chapter II, "Theory of High Polymers and Their Application to the Paper-Converting Industry", is highly technical and of doubtful interest to the general reader and most engineers. Other chapters are written in such a manner than even though they cover the basic engineering and chemistry involved, they can be readily understood even by non-technical people.

This volume can be recommended as having a great deal of interest to many people in the printing, decorative paper and packaging fields, particularly if they are interested in the production and materials used. The chapter on "Test Methods", is particularly well done and Mr. Mosher is to be complimented on the very excellent references at the end of each chapter, since they are sufficiently complete to allow the reader to pursue further any phase of particular interest.

Mr. Mosher has made two excellent contributions to the specialty paper field with these two volumes. It would be desirable if these volumes were kept up to date by future revision because of the number of new materials and products coming into this field.

*To obtain "Technology of Coated and Processed Papers" remit* $15.00 *direct to Chemical Publishing Co., Inc., Department CP,* 212 *Fifth Avenue, New York* 10, *New York. When inquiring specify CP* 6199 *on handy form, pages* 2 *and* 3.

## MANAGEMENT CONTROLS IN INDUSTRIAL RESEARCH ORGANIZATIONS

*Reviewed by T. J. Cummins, Jr.*
*Colonel, USAF*

Industry, in general, has been largely successful in developing useful and effective techniques for the appraisal and control of production, sales, finance, and other functional areas. The large and rapidly expanding activity of organized research and development, however, continues to present a challenge to management in these respects. Dr. Robert N. Anthony's book is a progressive step toward meeting that challenge.

This treatise is primarily a factual report of a comprehensive study and survey made by the author and his associates of current management control practices found in a variety of major industrial research organizations in the country. As such it is a report of what *is* being done by various research organizations in an effort to achieve the highest possible degree of efficiency from research activity — rather than what *should* be done.

The study will be most useful to persons engaged in the actual management of research organizations — from top management down to and including supervisors. Project engineers, research workers and personnel outside the research organization will also find the book useful from the standpoint of gaining a more thorough understanding of the problems of research and research management. Research managers and directors of long experience will probably find the book to be a recapitulation of familiar problems — but in a well organized and stimulating manner.

They will also find the report to be a valuable addition to their libraries as a convenient and compact source book including a practical classification of the really significant problems involved in the control of research, a cross-section of useful control practices found to be in current use by a variety of industrial research organizations, and the consolidation of a wealth of useful new data on industrial research in general.

Organization of the material in the book is excellent and manner of presentation makes for extremely easy and interesting reading. In Parts I and II, which occupy about 100 pages, problems of research management and principal factors relating to these problems are brought into sharp focus for the reader to prepare him for a realistic appreciation of the various control techniques to be presented.

In Part III, the most important part of the book (237 pages), a report of current control practices found in the survey to be most useful in industrial research organizations, is presented. Liberal use is made throughout the book of actual situations to illustrate practical applications of particular control techniques to specific research organizations. Part III also contains short chapters on "Yardsticks: Comparisons with other Laboratories" and "Control Problems in Government Laboratories." Part III is concluded with a chapter summarizing control practices in a well managed laboratory.

Part IV (some 200 pages) is devoted to detailed case studies of management control practices in four specific industrial research laboratories and an appendix covering a description of the survey upon which the report was based.

*To obtain book, remit $6.75 direct to Division of Research, Harvard Business School, Dept. CP, Soldiers Field, Boston 63, Mass. When inquiring specify CP 6200 on handy form, pages 2 and 3.*

## NOMOGRAPHY AND EMPIRICAL EQUATIONS

*Reviewed by D. S. Davis, Prof.,*
*Department of Chemical Engineering*
*Virginia Polytechnic Institute*

*"Nomography and Empirical Equations"*, containing 150 pages, deserves less physical resemblance to Lipka's *"Graphical and Mechanical Computation,"* (John Wiley & Sons, Inc., 1918) after which it is admittedly patterned and from which four of the plates are obtained.

From a most informative introductory chapter, the author, Lee H. Johnson, in "Part I, Nomography," leads the reader into parallel scale nomographs, Z-type charts, and the less essential diagrams that employ parallel and perpendicular index lines. Also found here are charts that consist of concurrent scales, those that deal with recurrent variables, and combined nomographs. "Part II, Empirical Equations," limited to data of two variables, covers routine methods of curve fitting, and curves that require two, three, and four constants.

Very clearly written, the book embodies many excellent features: introductory orientation at the beginning of each chapter, geometric rather than determinant approach to elementary nomography, tabular forms for nomographic design, generous illustrative examples, detailed proofs, fresh problems, logical arrangement, and adequate indexing.

Less pleasing are the somewhat archaic modulus charts, inherited from Lipka, which may be suitable for student work but are not always sufficiently accurate for industrial alignment charts, and the lack of recommendation or even mention of engine-divided natural and logarithmic scales upon which practicing nomographers depend. It also contains a slightly weak chapter on the industrially important recurrent variable type of chart and omits a comparison of calculated with observed values of the dependent variable so that closeness of fit can be judged.

Both the practical examples (125 in all), which conclude each chapter, and the fair-and-square illustrative examples appear to be well suited to most phases of engineering.

However, they tend to be somewhat more elementary than many problems encountered by chemists and chemical engineers. The latter are frequently confronted with multivariable data for correlation and with the construction of special nomographs known as line coordinate charts. These two topics escape treatment in a book distinguished by both thoughtful presentation and lucid explanation.

Carefully edited, the book is a simultaneous credit to author and publisher and may be regarded as an extremely readable revision of Lipka's *"Graphical and Mechanical Computation."*

*In order to obtain "Nomography and Empirical Equations" remit $3.75 direct to John Wiley & Sons, Inc., Department CP, 440 Fourth Avenue, New York 16, New York. When inquiring specify CP 6201 on handy form, pages 2 and 3.*


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## CHEMISTRY OF THE HYDRIDES

*Reviewed by Raymond P. Mariella, Chairman*
*Department of Chemistry*
*Loyola University*

*"Chemistry of the Hydrides"* was written by Dallas T. Hurd of the General Electric Research Laboratory. This 231-page book contains a wealth of correlated material. Author defines "Hydride" as a compound containing one other element and hydrogen, and then divides the known hydrides of the elements into various groups depending on the nature of the hydride bond. The groups are: 1) the ionic hydrides, containing the negative hydride ion; 2) the covalent hydrides, containing the usual non-polar covalent bond; 3) the transitional metal hydrides, including hydrides of the elements lying in the center of the long form periodic table; and 4) the border line hydrides, those relatively unstable hydrides which have properties intermediate between those of groups two (2) and three (3).

Brief preliminary discussion deals with the theory of the types of hydride bonds. Known hydrides of all the elements are discussed individually with respect to structure, properties, reactivity, and uses. Special precautions are mentioned whenever necessary. The bibliography seems up to date and rather comprehensive.

At the beginning of the discussion of each hydride, there is a summary of some of the vital properties of that hydride, i.e. formula, melting point, density, heat of formation, and dissociation pressure.

At the end of the book there is also a brief discussion of the complex hydrides, ($LiBH_4$, $LiAlH_4$), deuterides, and the nomenclature of hydrides.

Two final chapters on toxicology and vacuum manipulations of hydrides seem too brief. On the whole, the book will be welcomed by both the organic and inorganic chemist.

*To obtain "An Introduction to the Chemistry of the Hydrides" remit* $5.50 *direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N. Y. When inquiring specify CP 6204 on handy form, pgs. 2 and 3.*

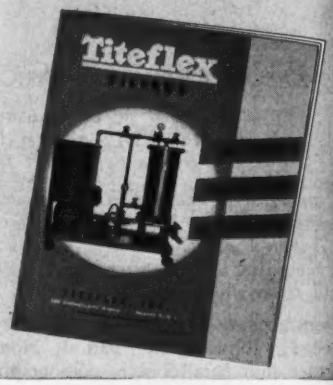
## SYNTHETIC RESINS and ALLIED PLASTICS

*Reviewed by G. Gavlin, Research Organic Chemist*
*Armour Research Foundation*
*Chicago, Ill.*

*"Synthetic Resins and Allied Plastics"* will be a valuable aid to any technical man requiring an encyclopedic source for industrial polymer chemistry, particularly to those research chemists seeking a means of liaison between their studies of new chemical reactions and the development of commercially significant products. While methods of plastics production and formulation are emphasized, excellent chapters on the problems of resinification bridge any possible gap between research and engineering.

General structure and chapter headings of this 747-page publication conform to those established by the late R. S. Morrell in the earlier editions. Introductory chapter deals with a summary of the chemical and physical properties of the most important classes of commercial polymers. Subsequent chapters describe in detail methods of preparation, properties, and general techniques of handling of protein and cellulose plastics, phenol-formaldehyde resins, amino resins and plastics, vinyl resins, acrylic resins,


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coumarone and indene resins, ester gums, varnish and lacquer resins, alkyd resins, shellac, and miscellaneous resins produced on a relatively small scale such as the polyfluoropolyethenes and the silicones.

These sections are given authoritative representation by a group of collaborators numbering some of Great Britain's most prominent polymer chemists including J. R. Alexander, E. A. Bevan, E. G. Couzens, B. S. Gidvani, L. G. Hill, R. Hill, H. Kitchen, H. M. Lanton, H. S. Lilley, L. R. Mernagh, R. S. Morrell, C. A. Redfern, R. S. Robinson and V. E. Yarsley.

The development of the fundamental basis for commercial polymerization demonstrates Dr. Morrell's mastery of the subject. His treatment is concise, but thorough, and fully documented. Discussion of the general conclusions of the many investigators in the field are considered in terms of existing polymer structure information. Of particular value is a critical summary which makes available to the reader one expert opinion that can be applied to the facts reported.

Volume is concluded with a brief but sufficient account of identification and test methods. Over-all treatment may fail to satisfy specialists who look for expert detail in every section, but as a critical survey fully supported with references, it is excellent.

*To obtain "Synthetic Resins and Allied Plastics" remit* $10 *direct to Oxford University Press, Dept. CP,* 114 *Fifth Ave., New York* 11, *N. Y. When inquiring specify CP* 6206 *on handy form, pages* 2 *and* 3.

## CHEMISTRY of CARBON COMPOUNDS IB

*Reviewed by G. W. Wheland, Professor of Chemistry*
*University of Chicago*

In this second part of the first volume of *"Chemistry of Carbon Compounds"* which is edited by E. H. Rodd, the treatment of aliphatic chemistry is extended to several different groups of di- and polyfunctional substances. The classes that are here discussed include the monocarboxylic acids with hydroxyl, amino, aldehydo, and keto groups; carbonic acid and its derivatives; dibasic acids; polyhydric alcohols and their oxidation products; carbohydrates; proteins; and enzymes.

The treatments of the simpler compounds are exceptionally complete and detailed, so that the book would in most instances be a valuable supplement to Beilstein and to Heilbron. In general, the discussions of the individual substances are less extensive than in Beilstein, but more so than in Heilbron. Theoretical explanations and historical reviews, although not entirely absent, are little in evidence.

With the more complex substances, the treatments become rather more sketchy. That of the carbohydrates, for example, is less complete than is the one in Gilman's *"Organic Chemistry,"* and those of the proteins and of the enzymes are too brief to be of great use to a biochemist. The book can, in fact, be described as part of a greatly expanded advanced text in descriptive organic chemistry. In view of its size, it is of course hardly suitable for adoption as a text in any ordinary course, but it should be extremely valuable as a medium-sized reference book.

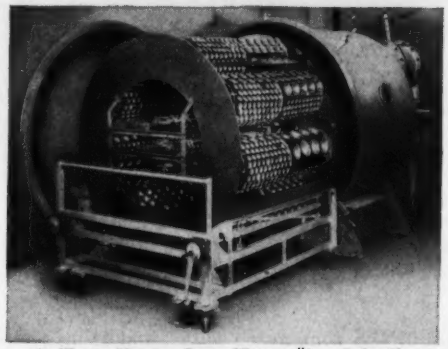
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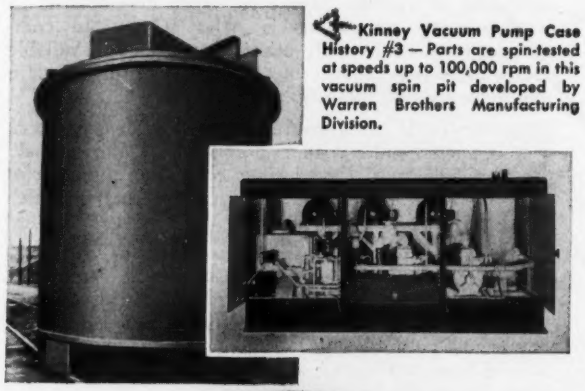

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Kinney Vacuum Pump Case History #4 — The Rauland Corporation aluminizes television picture tubes on this high speed vacuum production machine.



Kinney Vacuum Pump History #2 — Delta Electric Co. increases reflective power of lamp reflectors with this National Research Corporation vacuum coating unit.



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Properties of JC-60, a synthetic polycyclic hydrocarbon, were compared with: commercially available filled asphalt, precast filled asphalt, filled coumarone-indene, filled coal tar pitch, and filled plasticized gel-type coal tar pitch compositions.

Some of the requirements for materials of this class include: form permanent bond under all conditions, quick-setting, free from bubbles and impurities, resist action of waste products, resist infiltration, sufficiently flexible to permit some movement of the pipeline resulting from settlement, and sufficiently strong to resist breakage of the joint in the trench.

Atlas JC-60 is not affected by alkalis, acids, water, salts, or the ordinary constituents of the soil or sewage. It is completely resistant to bacterial attack. Tests have demonstrated the adhesion on glazed or unglazed pipe to be greater than 250 psi. This value is essentially unchanged on cooling or under conditions of long immersion.

Unlike compositions that give off irritating fumes, JC-60 will not catch fire at ordinary temperatures as it has flash and fire points above 600°F. It will not slump under normal hot weather conditions and retains its permanence and strength under extremes of climate. Ten hours of heating at 500°F produced no appreciable change in its characteristics.

Demonstrating its flexibility is the fact that vitrified clay pipe lines joined with the material will not fail even when deflected as much as 5° from the normal. Tests made by independent laboratories and government bureaus have shown JC-60 joints to withstand water pressure with a head of 20′ for 24 hr without any signs of infiltration or exfiltration.

Two of its properties contribute to its ability to stop penetration by root growths: hardness and adhesion. Because of its hardness, roots cannot penetrate the surface of JC-60 — they are forced to change direction. In addition, roots which cannot penetrate the compound are also prevented from doing so at the interface of compound and joint. This is due to its unusually high adhesion.

Tabulating some of its properties we find:

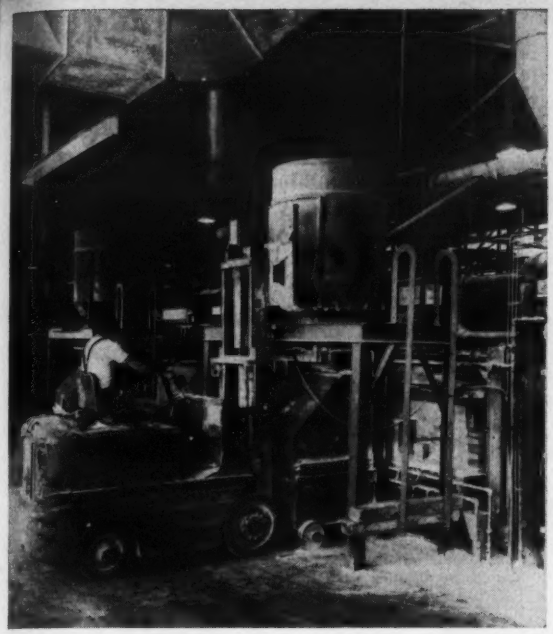
| | |
|---|---|
| Adhesion to unprimed clay pipe, psi | 250 |
| Adhesion to #60 primed clay pipe, psi | 400 |
| Tensile strength @ 77° F | 500 |
| Penetration ASTM D5-25 @ 77°F | 0 |
| @ 115°F | 1 |
| Melting point (B & R) °F | 210 |
| Specific gravity @ 77°F | 1.65 |
| Maximum settling ratio | 1.25 |
| Effect of long-term heating | none |

(Atlas JC-60 is a development of The Atlas Mineral Products Co., Dept. CP, Mertztown, Pa. . . . or for more information check CP 6210 on handy form, pages 2 & 3.)

***High heat load in glass melting instigates different approach in air conditioning . . .***

application points way to possible solution of other high heat-producing problems

Recently completed and put into production was a textile fiber manufacturing plant of the Owens-Corning Fiberglas Corp. It is located in Anderson, S. C. and covers an area of 265,400 square feet. It is devoted exclusively to the



One phase in the operation of a new Fiberglas plant where the development of an unusual cooling and air conditioning system enables employes to work amid very high temperatures. This photo shows hoppers containing silica sand, limestone and other ingredients being placed into position by lift trucks at side of glass melting furnaces

manufacture of textile fibers as distinguished from glass wools and insulating types of Fiberglas.

Because of the high heat load in the glass melting operation and temperatures encountered in the melt area, it was necessary to develop a new approach to provide successful air conditioning for the Anderson plant. This application points the way to a possible solution of many other industrial problems once considered virtually insurmountable because of high heat loads.

It was in the design of the air conditioning system for the unit designated the "furnace hall" (where the glass is made and extended into fibers) that a new method was devised. This building is 100 feet wide, has an overall height of approximately 40 feet, and is divided into several levels. First floor level is known as the winding level, above this is the forming level, and then the furnace level.

Indicative of the temperatures in and around the furnaces are the following: bushings through which molten glass fibers are drawn, 2300°F; outside surface of forehearth, 450°F; surface temperature of front face of furnace, 550°F; and surface of supporting structural steel or furnace and forehearths, 350°F. With these high temperature heat sources so closely surrounding the operators, it was feared that operating conditions would be unbearable. This was verified when a pilot plant model of the plant was put into operation.

A study of the heat load indicated that the greatest portion of the load was due to radiation from the heated surfaces. This heat could not satisfactorily be overcome by conventional air conditioning methods. Recommended was the use of a series of radiant cooling panels and shields in conjunction with a central station air conditioning system.

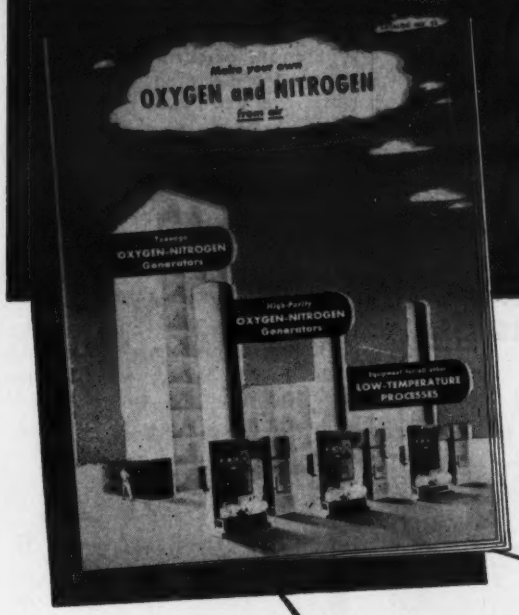
These radiant cooling panels and shields were designed to enclose, as nearly as possible, both sides and bottom of the forehearths, as well as the front of the furnace. Because of their location, the panels not only remove most

(*Continued on page* 143)


Cut Costs! NEW CATALOG

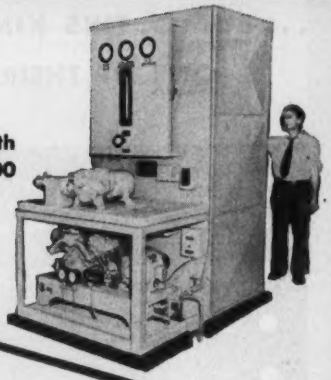
shows how you can make your own

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High-Purity
OXYGEN-NITROGEN
Generators

14 standard models, with capacities from 300 to 12,000 cubic feet per hour



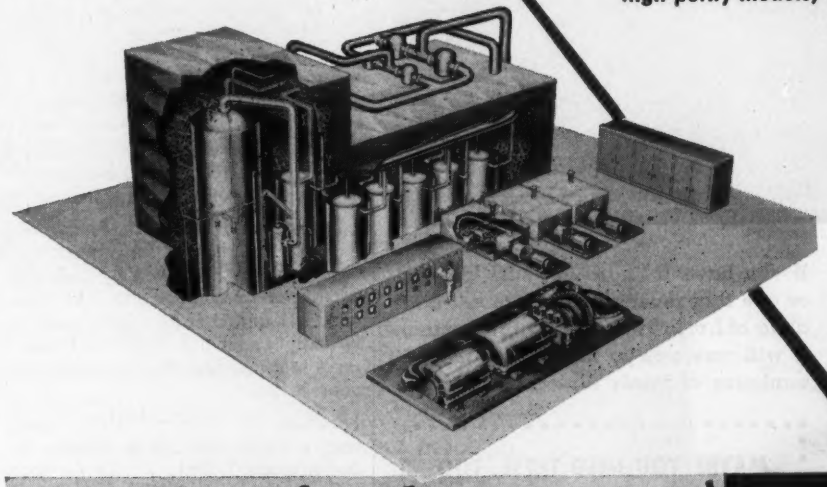
NEW!

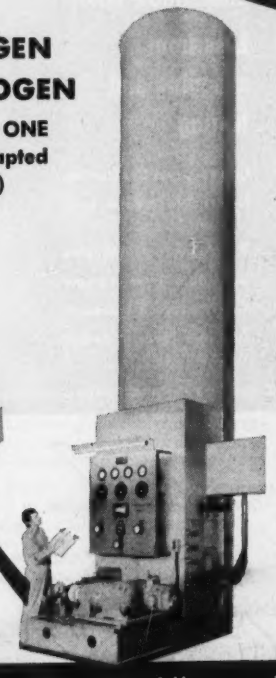
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OXYGEN-NITROGEN-ARGON
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Specialists in Equipment for All Low-Temperature Processes

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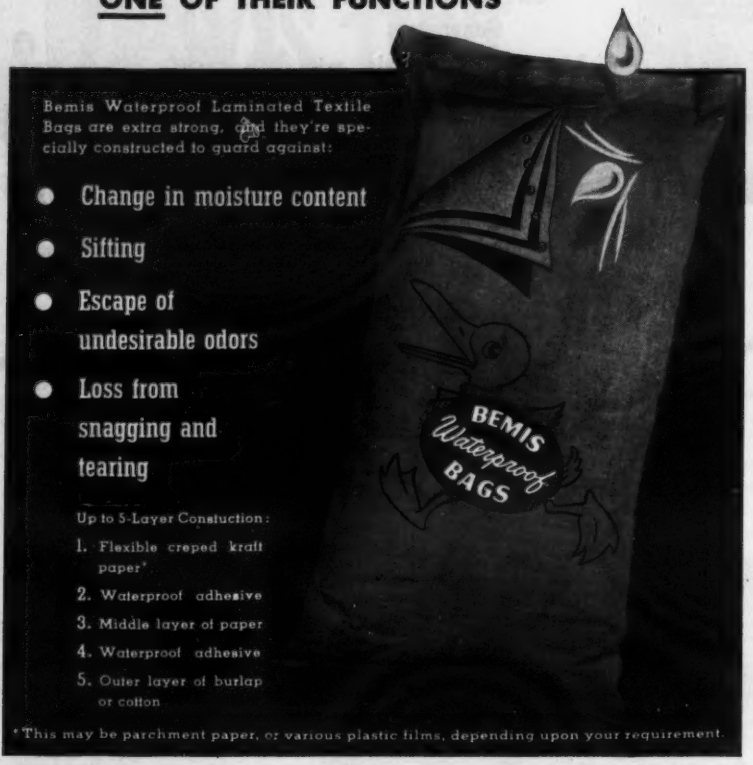
Air Products, Incorporated
Dept. K, Box 538, Allentown, Pa.
NAME.....TITLE.....
COMPANY.....
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CITY.....STATE.....

When inquiring check CP 6211 on handy form, pgs. 2-3

WE CALL 'EM

# Waterproof Bags

...BUT...THIS KIND OF PROTECTION IS ONLY ONE OF THEIR FUNCTIONS




If you have a "hard-to-pack" product or one that must stand the rough handling of l. c. l., truck, or export shipment, it will pay you to investigate the advantages of Bemis Waterproof Bags.

MAYBE YOU NEED THESE, TOO

If you don't require the exceptional protection of Bemis Waterproof Bags, Bemis Multiwall, Cotton or Burlap Bags are your best bet.

WHATEVER KIND OF BAG YOU NEED, WE MAKE IT!

Bemis

"America's No. 1 Bag Maker"

408 Pine St., Box 92, St. Louis 2, Mo.

When inquiring check CP 6212 on handy form, pgs. 2-3


## CONSTRUCTION

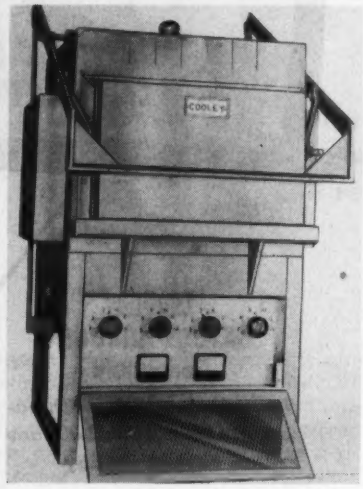
***Placement of controls at front of furnace simplifies use . . .***

operating temperature covers range from 1650° to 2500°F

*Uses:* As heat treating furnace to harden tool steels.

*Features:* Tap changing switches and ammeters are located at front of furnace to simplify operation.

*Description:* Three models of electric furnaces cover temperature range from 1650° to 2500°F. Chamber sizes have width, height, and length dimensions of 6¼ x 4 x 9", 12 x 8 x 18", 12 x 8 x 24". Power is controlled by use of multiple-tap transformers arranged for select voltages to be applied to Globar heat elements located at top and bottom of chamber.



Tap changing switches and ammeters are located at front of furnace

Control of temperature is handled by standard pyrometer arrangement. Furnace is heavily insulated by high temperature refractories. Size and thickness of unit's front door make it virtually a moving front wall which gives high thermal efficiency and small door losses.

(Product of Cooley Electric Mfg. Corp., Dept. CP, 38 S. Shelby St., Indianapolis 7, Ind. . . . or for more information check CP 6213 on handy form, pages 2 and 3.)

***Construction and features of process equipment***

Eight-page bulletin describes five types of processing equipment designed for use in various unit operations. Units find application in processes of reaction, agitation, heat


HIGH-SPEED PIPE THREADING




"RAPIDUCTION" MACHINES

● Typical "RAPIDUCTION" speeds: 11 seconds for 1½" pipe; 25 seconds for 3" pipe; 66 seconds for 6" pipe; comparable speeds on all other sizes within range of these machines.

No. 6-A "RAPIDUCTION": Standard range 1½" to 6" pipe; bolt range 1" to 4".

No. 8 "RAPIDUCTION": Standard range 2½" to 8" pipe.

One die-head and one set of dies threads all sizes of same pitch, right hand, American National Standard, without change. Write for "RAPIDUCTION" catalog.

THE OSTER MANUFACTURING CO.

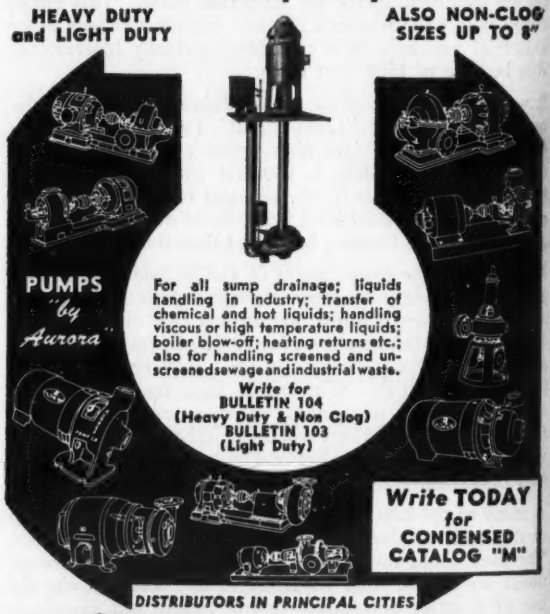
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When inquiring check CP 6214 on handy form, pgs. 2-3

Aurora Vertical Sump Pumps are "TOPS"

HEAVY DUTY and LIGHT DUTY

ALSO NON-CLOG SIZES UP TO 8"




AURORA Always PUMPS

AURORA PUMP COMPANY

62 Loucks Street, Aurora, Illinois

When inquiring check CP 6215 on handy form, pgs. 2-3

transfer, distillation, sublimation, crystallization, and drying. Special designs are available for corrosive, abrasive and erosive, high temperature, and other unusual conditions.

Numerous photographs and line drawings illustrate features of construction and numerous typical installations. Unique advantages of various units are tabulated in each description. Convenient information is provided about procedure of design and handling inquiries for special information.

Bulletin is issued by Bethlehem Foundry and Machine Co., Dept. CP, Bethlehem, Pa. When inquiring specify 6216 on handy form, pages 2 and 3.

***Toggle valves control vacuum or pressures up to 500 psi . . .***

designed for use in installations where angle style is desired

*Uses*: Controlling high vacuum systems or pressures up to 500 psi under certain conditions.

*Features*: Quick opening valve with no leakage through stem or seat.

*Description*: Toggle valves were designed for use in installations where angle style is more adaptable than straight pattern valves. Readily replace stopcocks and will not leak under pressure.



**Angle type toggle valves are adaptable for many installations**

Internal materials of construction are brass and synthetic rubber. Seat is normally synthetic rubber, but can be altered to meet specific conditions of operation.

Units are suitable for instrument panel installation. For this use valves are furnished with threaded bonnets and mounting nut. For identification purposes lever may be threaded and plastic knobs of various colors added.

(Toggle valves are products of Hoke, Incorporated, Dept. CP, 145 S. Dean St., Englewood, N. J. . . . or for more information check CP 6217 on handy form, pages 2 and 3.)

**For more information on product at right, specify CP 6218 . . . see information request blank between pages 2-3.**



ALOYCO No. 111-A gate valve for 150 pounds service is made in a wide range of analyses to specification and regularly stocked in popular alloys.

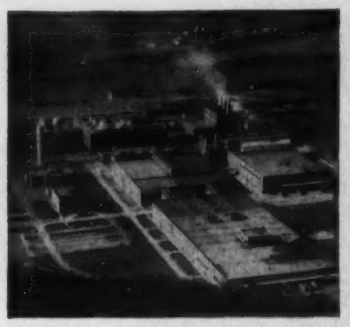
## Lasts longer in corrosive service

This bolted bonnet type gate valve, made to specification, provides the three basic advantages of all ALOYCO valves . . . (1) special engineering for severe corrosive service through (2) extensive metallurgical research and (3) production of high alloy valves exclusively.

## Celanese efficiently handles hot and cold acids with ALOYCO valves

**THE CORROSIVES:** Cold, hot and boiling vapor glacial acetic acid; cold mixtures of glacial acetic acid and acetic anhydride; cold, weak (30%) mixtures of acetic acid.

**THE APPLICATION:** Manufacture of cellulose acetate flake (raw material for many plastics) from purified cellulose in combination with acetic anhydride and acetic acid, with sulfuric acid as catalyst. (Cellulose acetate flake dissolved in acetone is extruded into filament yarn and staple fiber for textiles.)



*This Celanese plant enjoys lower valve cost and longer valve life with ALOYCO valves.*

**THE PLACE:** Celanese Corporation of America, Celco plant, Narrows, Va.

**THE VALVES:** ALOYCO 18-8SMo No. 111-A gate valves.

**THE RESULTS:** Former acid-resistant bronze valves with stainless steel trim proved unsatisfactory on cold acid mixtures. On the other hand, the original ALOYCO valves, installed when the plant opened in 1940, are still operating perfectly with only minor maintenance.

**THE BACKGROUND:** No other valve maker has such extensive facilities for meeting corrosive conditions with the right alloy and the right valve.

ALOYCO is the *largest specialist* in corrosion-resistant valves, applies them to solve successfully problems of corrosion, contamination, discoloration, temperature extremes, proper application.

If you have a problem of this nature, address it to ALOYCO's corrosion engineers for a profitable solution.

**ALLOY STEEL PRODUCTS CO., INC.**
**1302 West Elizabeth Avenue, Linden, N. J.**

**Longer Lasting**
**ALOYCO VALVES**
**1st in Corrosive Service**




## She's looking through someone else's eyes

Few purchases are made without thought of how they will be judged by others.

Men who order more than 85 per cent of all Multiwall bags are well aware of this. They rate* a good impression high on their purchasing check list. This, of course, includes a good printing impression.

When your Multiwall bag puts its best foot forward visually, you take a long step toward both winning and holding your customer.

The *use* of what you sell, and the *re-orders* you receive, *inevitably* are influenced by your bag — how it looks, how easy it is to read, how easy it is to remember.

Most often, the best-dressed Multiwalls are Union Multiwalls. This is one of many good reasons why the biggest users of Multiwalls today look to Union for a greater proportion of their needs than at any other time.

More so every day . . .

**IT'S UNION FOR MULTIWALLS**

TRADE MARK UNION

*August, 1951 research study.

UNION BAG & PAPER CORPORATION • NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING


### *Introduce odorless, scrubbable flat enamel paint . . .*

and a silicone-base moisture repellent coating

*Uses*: Flat-finish enamel paint can be used over wood, wallpaper (that contains no bleeding colors), plaster, plaster board, plywood, concrete and block-type construction.

Water repellent is for masonry, brick, concrete, cinder block, and stucco.

*Features*: Paint product is odorless, scrubbable, and self priming. Repellent prevents cracking and chipping caused by freezing of absorbed water, stops efflorescence, and leaves no surface film or discoloration.

*Description*: Utilivar Master Painters' Flat Enamel is an alkyd-type, interior flat wall finish. Rooms may be used as soon as the paint is dry — there is no unpleasant odor during painting or drying period.

It may be brushed, sprayed or applied with a roller. Available in white only at present with a full line of colors expected in the future.

Ferroplastic Water Repellent is a clear solution of silicone which sheds rain water, wet snow, water from gutters, etc. It contains no wax, and any oil-base paint may be applied over it.

Application of enamel paint is by brush or spray, with two coats recommended for highly absorbent or open-texture surfaces.

(Announced by McDougall-Butler Co. Inc., Dept. CP, Buffalo 14, N. Y. . . . or for more information check CP 6219 on handy form, pages 2 and 3.)

### *Features and uses of hose clamps*

Construction features, specifications, and applications of six different types of hose clamps are reviewed in 4-page bulletin.

All types and sizes of clamps are illustrated in detailed photos. Tables summarize specifications for capacities and sizes. Numerous applications are listed for each type of clamp.

Bul 125 is issued by Hose Accessories Co., Dept. CP, 2702 N. 17th St., Philadelphia 32, Pa. When inquiring specify CP 6220 on handy form, pages 2 and 3.

For more information on product at left, specify CP 6221 . . . see information request blank between pages 2-3.

### Air Conditioning System

(*Continued from page* 139)

of the heat radiated from the various surfaces, but they also completely shield the operators from these radiant heat sources.

Because of the high temperature radiation sources and because the panels are used as shields, as well as panels, the necessary refrigeration effect is achieved by circulating 85° water through them. Slightly higher heat removal capacity that could be gained by using colder water was insufficient to warrant the use of chilled water in the panels. As a result, the panels are supplied with cooling water from a spray pond which is the most economical way of providing this large amount of cooling capacity. As employed in the Anderson plant, the cooling panels are used to remove a heat load equivalent to 385 tons of refrigeration.

Cooled and dehumidified air is supplied to the area from a 55,000 cfm central station apparatus located in the basement of the furnace hall. This apparatus uses a standard spray type dehumidifier and supplies all outside air. Use of 100% outside air is required to compensate for the exfiltration from the forming level to the furnace level.

Upper or furnace level of the building, containing the furnaces and their stacks, is cooled primarily by natural ventilation. This ventilation is provided by continuous rows of louvers in the side walls of the building combined with large area air movers located in the roof. Natural ventilation is supplemented by six strategically located fan units which are used to supply outside air directly down to the working level.

Above described air conditioning system maintains conditions of 80° dry bulb and 50% relative humidity.

(Air conditioning subcontractor on the project was the Carrier Corp., Dept. CP, 300 S. Geddes St., Syracuse 1, N. Y. . . . or for more information check CP 6222 on handy form, pages 2 and 3.)

### *Possibility of short circuits is prevented by long skirts of wire connector . . .*

easy removal of shell permits quick changes in wiring and simplifies inspection

*Uses*: For splicing two or more wires together.

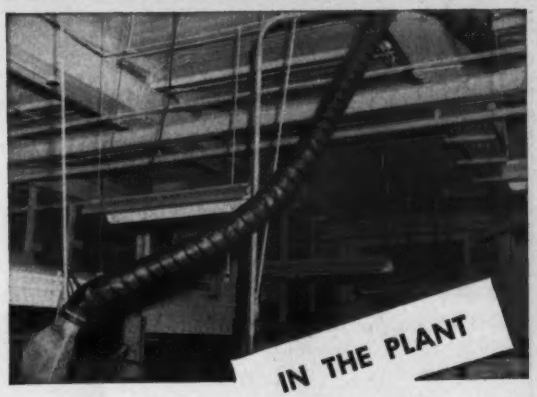
*Features*: High dielectric shell of unit has a long skirt that completely covers wire insulation and prevents chance of a short circuit. Diameter is small, permitting use in close quarters. Wire splice may be inspected at any time by simply unscrewing protecting shell. For change in wiring, connector may be removed, used for making new splice.

*Description*: Hi "Set Screw" Wire Connector consists of two parts, a solid brass sleeve with set screw and a Bakelite shell. Two or more wires may be spliced together by stripping off insulation near end, inserting wires into sleeve, and tightening set screw. Bakelite shell is then placed over entire joint and tightened on precision threads.

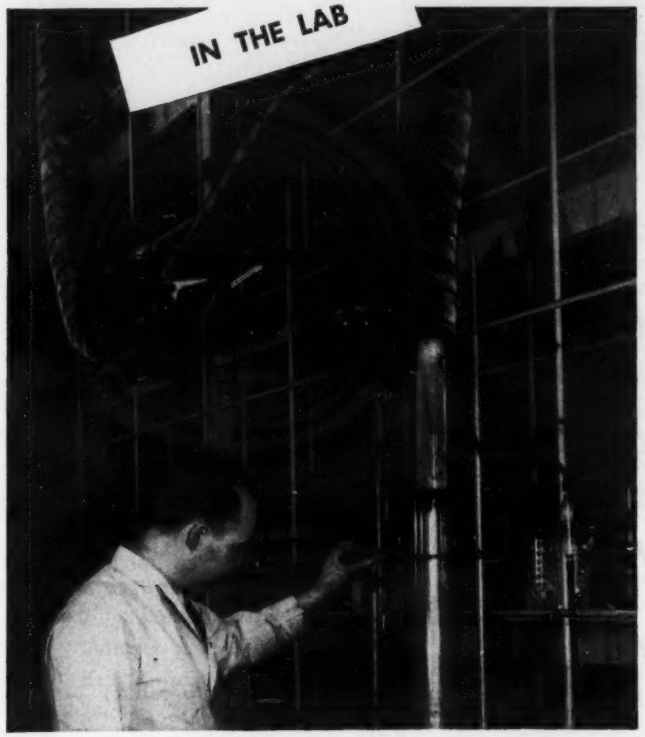
Sleeve and set screw are of brass to prevent corrosion. Both are of heavy proportions. Underwriters' approval includes both solid and stranded wire and combinations of both. Units may be used for a variety of wire sizes.

(Product of Holub Industries, Inc., Dept. CP, Sycamore, Ill. . . . or for more information check CP 6223 on handy form, pages 2 and 3.)


Why move work around to get to present exhaust ducting?




Take SPIRATUBE® to the job!




With SPIRATUBE — the new type flexible ducting — you can set up production lines where you want them without expensive changes in your dust or fume removal system. SPIRATUBE connects quickly, easily to your present lines — and bends anywhere with minimum crimping. No turn is too short, no angle too acute. No elbows or special fittings to bother with in going around obstructions.

Best of all, YOU CAN INSTALL SPIRATUBE YOURSELF! That cuts down-time, keeps your production line going. The initial cost of Spiratube is small . . . and its life equals — sometimes exceeds — rigid ducts.

Standard sizes for all requirements are immediately available from well-stocked distributors — coast-to-coast!

*For all ducting systems:*

FLEXFLYTE® SPIRATUBE® AYRTUBE®

Flexible Tubing CORPORATION

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FREE! Full details on this amazing, cost-saving ducting. Fill in coupon and mail

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Please send me your new catalog on Flexible Tubing products.

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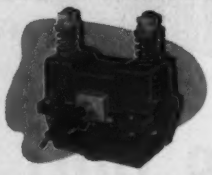
Address_____

City_____ State_____

When inquiring check CP 6224 on handy form, pgs. 2-3

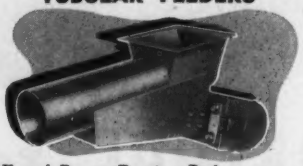
## The *Right* Formula For a 'Positive Reaction' in the Handling of Bulk Chemicals

**ELECTRIC VIBRATORS**



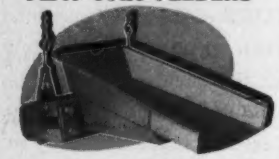
Make Stubborn Materials Flow Freely

**TUBULAR FEEDERS**



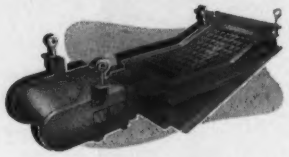
Feed Pure, Dusty, Poisonous Materials Safely

**FLAT PAN FEEDERS**



Up To Hundreds of Tons Per Hour—Variable Control

**VIBRATING SCREENS**



Wet or Dry—Single or Multiple Decks

**HOPPER LEVEL SWITCHES**



Maintain Desired Amount of Material In Bins, Hoppers

Fast, Economical Handling of Most All Chemical Products... Extremely Hot, Poisonous, Fine, Abrasive, Lumpy, Dry, Damp, Pure.

# SYNTRON

## Material Handling Equipment

Syntron Vibratory Equipment assures 'positive' handling of bulk chemicals — easily and efficiently. It is adaptable to the many material handling applications found in chemical processing.

**Electric Vibrators** open up clogged bins, hoppers and chutes — make them free-flowing.

**Vibratory Feeders,** equipped with a variety of troughs for different chemicals, feed from pounds to hundreds of tons per hour.

**Vibrating Screens** remove foreign objects and lumps from powdered chemicals — sizing chemicals in granule form.

**Hopper Level Switches** keep a constant level in hoppers handling dry chemicals not exceeding nut-size.

Syntron Vibratory Equipment handles these many different operations easily and efficiently. No motors, bearings, gears, idlers, etc. to wear and require oiling. Simple electromagnetic vibration does the job.

Available in different sizes and styles, from small to large models.

***For Full Details Write for Catalog No. 525***

**SYNTRON COMPANY**

110 Lexington Avenue — Homer City, Penna.


When inquiring check CP 6225 on handy form, pgs. 2-3

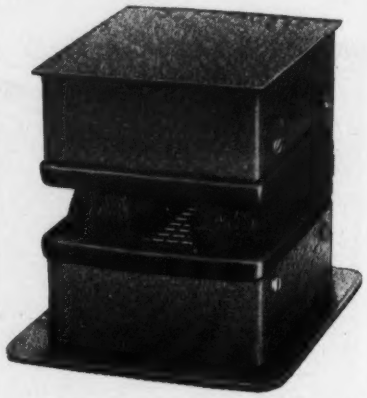
***Static electricity, dust are quickly removed from strips . . .***

used separately or in processing, unit makes a clean sweep

*Uses*: For removing surface static from sheet material, strips, film. Units were originally designed for removing static, dust, and lint in photographic work, but uses have been extended outside the photography field.

*Features*: Unit is so constructed that it can be either integrated into automatic processes or used separately.

*Description*: Staticmasters used in the photographic industry come with brushes in two sizes, 1 and 3". The



Removes static with a clean sweep

Commercial model is in 3 and 6" sizes—with polonium grid above and below the aperture to speed removal of static.

(Development of Nuclear Products Co., Dept. CP, 10173 E. Rush St., El Monte, Calif. . . . or for more information check CP 6226 on handy form, pages 2 and 3.)

***Describes equipment for treating water***

Colorful bulletin describes conditioning and filtering units for purifying water. Twelve pages of photographs and text review problems and methods of water conditioning.

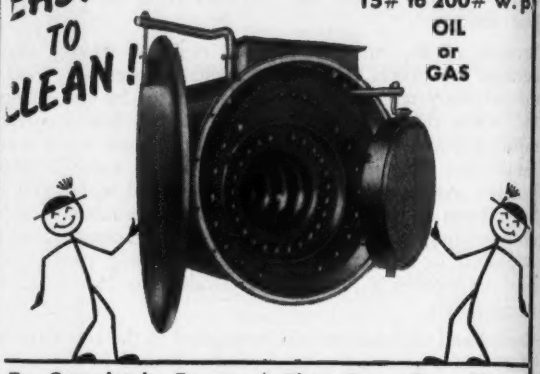
Cutaway view and flow diagram illustrate discussion of construction and operation of basic chemical treating unit. Features and specifications of filtering equipment are shown in photographs. Accessory units are outlined.

Bul 2225 is issued by The Permutit Co., Dept. CP, 330 W. 42nd St., New York 16, N. Y. When inquiring specify CP 6227 on handy form, pages 2 and 3.


# AMESTEAM GENERATOR

EASY TO CLEAN!

10 to 500 h.p.
15# to 200# w.p.
OIL or GAS



To Completely Expose Furnace and All Tubes . . . Open One-Piece Rear Flue Cover . . .

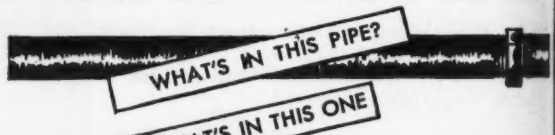
Then Open One-Piece Rear Baffle. There are Ample Clean-Out Doors in Front End, too!

**AMES IRON WORKS INCORPORATED**

BOX D-11, OSWEGO, N.Y.

*Builders of Better Boilers Since 1848*


When inquiring check CP 6228 on handy form, pgs. 2-3


YOU CAN TELL AT A GLANCE WITH

## QUIK-LABEL PIPE MARKERS

**Identify every pipe in your plant quickly and inexpensively with Brady Pipe Markers. They give you a uniform system of identification based on ASA Standard A13. Anyone can apply and everyone can identify the pipe contents and direction of flow. Cut maintenance time. Make your plant a safer place to work. Over 235 different markers in stock. Specials made to order.**

**QUIK-LABELS come on handy dispenser cards. They are printed in large black letters on approved ASA background colors. Applied in a jiffy—they stick without moistening. Use indoors or outdoors. Cost only a few cents per marker.**

WRITE FOR Free SAMPLES AND USEFUL CATALOG

*DISTRIBUTED IN 125 PRINCIPAL CITIES*

WIRE MARKERS
PIPE MARKERS
SAFETY SIGNS
PRINTED ROLL TAPE
MARKS & STENCILS

*MANUFACTURERS OF SELF-STICKING PRODUCTS*

**W. H. BRADY COMPANY**

737 W. Glendale, Milwaukee, Wisconsin


When inquiring check CP 6229 on handy form, pgs. 2-3

### *Lives, labor, and property may be saved through use of mat switches . . .*

units placed under floor covering can be actuated by pre-determined foot pressure

*Uses*: Typical application is as versatile foot switch for various industrial and commercial electrical equipment. Units can be obtained that are actuated by hand pressure or by weight of a heavy vehicle. Other uses include actuators for automatic door operators, interplant traffic controls, safety and production devices for machine operators, and automatic lighting of yards and signs.

*Features*: Switches offer wide opportunities for automatic labor-saving operations and the protection of life and property. Although general application is that in



Mat switch, 18 x 30", with control box

which foot pressure closes circuit, switches can be obtained which are actuated by pre-determined pressures ranging from a few ounces to several tons.

*Description*: Switchmats are line of extended area electrical switches in form of sheets or thin mats. SPST switches are available in any size or shape from 2 x 2" up to 36 x 144". Since units are only 3/16" thick, they do not obstruct foot or vehicle traffic when used on floors, platforms, stairs, or treads. Just as pressure from foot or another source closes circuit, release of pressure instantly opens it.

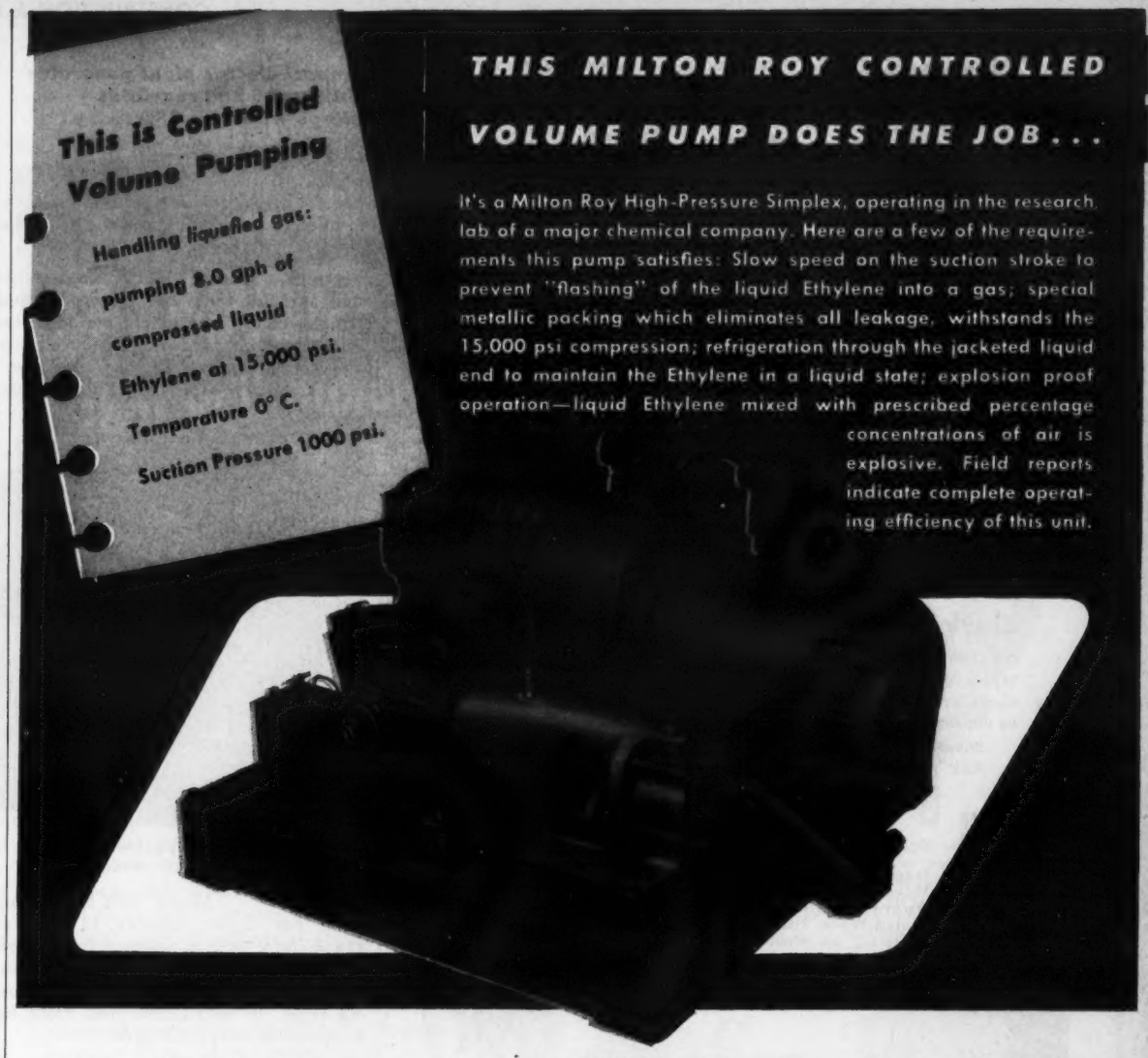
Mats are hermetically sealed with vinyl, rubber, or neoprene for protection from moisture and weather. Units can handle up to one ampere at 110 volts directly. High voltage, high current devices can be controlled when switches are used in conjunction with manufacturer's control boxes. Available controls cover types for temporary and permanent installations, with instantaneous or delayed action.

(Product of The Recora Co., Dept. CP, 7419 S. Western Ave., Chicago 36, Ill. . . . or for more information check CP 6230 on handy form, pages 2 and 3.)

### *Water repellent silicone resin — in aqueous solution*

Performance data and functions of water repellent, silicone coating are discussed in 4-page bulletin. Material is an aqueous solution of silicone resin compounds designed for masonry surfaces with a high lime content. Manufacturer reports that invisible coating will not discolor or wear away and test data indicate a life expectancy of 10 years or more. Bulletin surveys procedure, results, and significance of various tests; it also describes method to follow when applying coating.

Technical Data Guide 44 is issued by L. Sonneborn Sons, Inc., Building Products Div., Dept. CP, 80 Eighth Ave., New York 11, N. Y. When inquiring specify CP 6231 on handy form, pages 2 and 3.


**The successful pumping of a hydrocarbon of the peculiar and difficult nature of liquid Ethylene indicates the versatility of Milton Roy Controlled Volume Pumps. The fact that liquid Ethylene is an important building block for many organic compounds—used in anti-freezes, plastics, insecticides, resins etc.—makes high-pressure pumping of this liquid in controlled volume an industrial necessity.**

**And for those diversified liquids usually considered as gases at normal temperatures and pressures—carbon dioxide, Butane, Vinyl Chloride, Propane, Propylene, to mention just a few, Milton Roy Controlled Volume Pumps have pin-point application. They give flawless service.**

**Call the Milton Roy representative listed in your classified telephone directory for additional information on Milton Roy Controlled Volume Pumps for *your* specific process problem. Or write us direct.**

WITH THE EXCLUSIVE STEP VALVE DESIGN

MILTON Roy COMPANY

1354 EAST MERMAID LANE, PHILADELPHIA 18, PA.

MANUFACTURERS OF CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

When inquiring check CP 6232 on handy form, pgs. 2-3



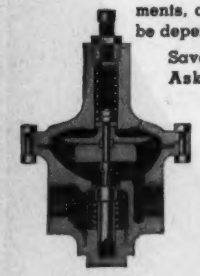
Controlled Pressure for efficient operation

**Clark Pressure Reducing and Regulating Valves**

are precision-made for positive pressure control on air, gas or steam lines.

Where different types of equipment, with varying pressure requirements, are operated from a common line, Clark Regulating Valves can be depended on to deliver automatically the "just right" pressure to each.

Save on fuel, maintenance and protect expensive equipment. Ask your Clark representative to specify the right Clark valves for your needs . . . or write us direct.

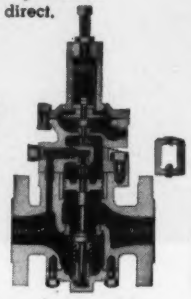


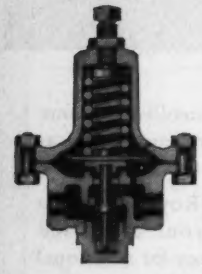
**TYPE KRV**

Pressure Reducing Valve. Diaphragm Operated-Single Seated Valve. Sizes ½" to 1½" for initial pressures up to 250 P.S.I. Reduced pressures to 85 P.S.I.

**TYPE CRV**

Pressure Reducing Valve. Integral pilot controlled, piston operated. For pressure control from "dead end" to full capacity. Sizes ½" to 6".





**TYPE ORV**

Pressure Reducing Valve. ⅜" and ½" Single Seated, Spring Loaded, Diaphragm Actuated. For initial pressures to 250 P.S.I. Reduced pressures to 200 P.S.I.

**QUICK-CLEANING STRAINERS**

Remove dirt, scale and grit from steam, fluid and gas lines. Sizes ½" to 3" I.P.S. For pressures to 250 P.S.I.



**THE CLARK MANUFACTURING COMPANY**

**1848 East 38th St. • Cleveland 14, Ohio**

Clark

THE HOME OF DUO-STEP LEVERAGE



The complete line of dependable fluid controls

When inquiring check CP 6233 on handy form, pgs. 2-3


***Compact electric plant generates 3500 w, AC and regulates voltage within ± 3% . . .***

tests confirm fact that it can safely draw to 4000 w at intervals of two hour periods

*Uses*: As all-round electric plant providing primary or emergency electric power for stationary, portable, or mobile applications.

*Features*: Model 305CK electric generating plant is rated at 3500 watt, AC power, but will also give 4000 watt power for intermittent period of two hours duration. This allows extra power for peak loads or emergency power requirements. Voltage regulation of ± 3% makes unit particularly serviceable for applications where regulation is vital factor.



Electric generating plant meets demand for high capacity in small-sized unit

*Description*: Model 305CK is designed to meet demand for higher capacity in small-sized plants. The 115 v, 60 c unit is powered by two-cylinder, 4-cycle, air-cooled gasoline engine. Engine improvement gives this model an increased output of 500 w over earlier generating plant. It will deliver full rated load with fuel consumption of only 0.68 gph.

Unit is available in manual or remote starting models. Former is equipped with starter, which is activated through high-tension magneto ignition. Remote starting plants are electrically cranked with generator acting as cranking motor. Start-stop stations make it possible to start motor from locations distant from plant. Fully automatic and line transfer controls are available for remote starting units. For standby service, line transfer control will automatically start plant (within seconds) after highline power fails. Plant stops automatically when power is restored. (Product of D. W. Onan & Sons Inc., Dept. CP, Minneapolis 14, Minn. . . . or for more information check CP 6234 on handy form, pages 2 and 3.)

***When normal power source fails, control device sets standby unit into action . . .***

and after performing their service, contactors automatically make way for regular current

*Uses*: For transferring electric circuits to an emergency power source when normal supply fails. Panel can be used on special circuits such as signal or communication systems, regulating and metering equipment, emergency


Is it worth $101.55 to keep granular materials Moving through your hoppers?



That's all it costs to make a complete installation of a Cleveland Air Vibrator on an average steel bin of 10-ton capacity in a chemical processing plant!



This cost will come back to you FAST in terms of uninterrupted flow of materials, longer life of your bins and hoppers and generally better production.

Arching, bridging, sticking of dry materials in YOUR plant just won't exist, if you use Cleveland Air Vibrators.

There's a type and size to fit your problem . . . Standard metallic impact and air-cushioned quiet types.

This product is doing a job in chemical plants everywhere — on bins, hoppers, chutes, screens, storage tanks and other applications.

*Catalog No. 105 gives further details.*

***BIN Stuck Lately?***

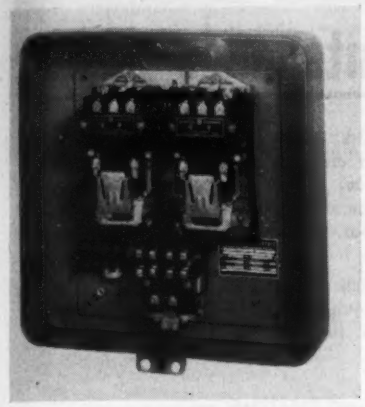
THE CLEVELAND VIBRATOR COMPANY

**2706 Clinton Ave. • Cleveland 13, Ohio**

When inquiring check CP 6235 on handy form, pgs. 2-3

lighting circuits, fire protection apparatus, etc, when regular supply is interrupted.

*Features*: Control is completely automatic. Panel not only sets standby power supply unit into service and makes the switch over when normal power is resumed, but can also control standby power unit, such as an auxiliary generator, by turning it on and off at appropriate times.



Controls operation of standby power units

*Description*: Panel consists of mechanically interlocked normal-source and emergency-source contactors and a pilot contactor which act as the "heart" of the unit. A special contactor is featured whose air gap is unaffected by the condition of the striking surface. This air gap is a permanent, unchangeable part built into the stationary magnetic structure to permits reliable operation no matter how often or infrequently contactors drop out.

Load contactors feature a coil completely impregnated in a solid block of solventless varnish in order to assure maximum protection against moisture and mechanical damage.

For special applications requiring close control of transfer voltage, as on power lines of poor regulation, a voltage-sensitive relay can be provided to transfer the load at a very closely controlled voltage point.

Also, in applications where momentary voltage interruptions are sometimes encountered, as from lightning surges, a time-delay relay can be used to prevent the transfer until after a specified time has elapsed.

Standard line of automatic throw-over panels, size 1 to 3, employ vertical lift contactors: sizes 4 to 6 use the clapper-type.

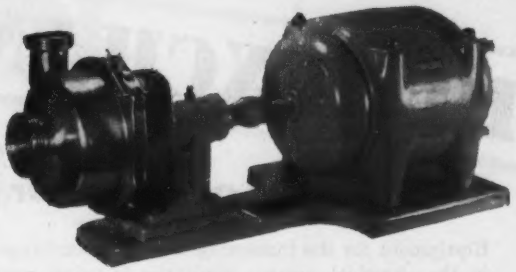
(Development of General Electric Company, Department CP, Schenectady 5, New York. . . . or for more information check CP 6236 on handy form, pages 2 and 3.)

### *Reprint summarizes types of fire retarding paints*

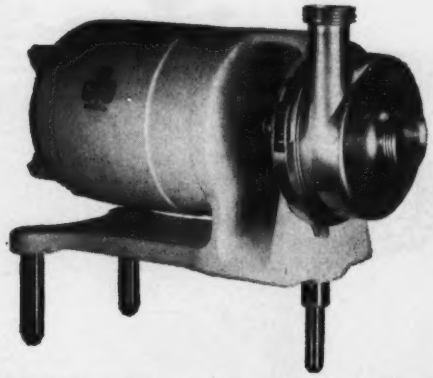
Five-page folder is reprint of trade journal article, which summarizes types of fire retarding paints available and lists many patented formulas. Author, Mr. Leon Sternberg, Director of Chemit Co., lists approximately 16 properties which should characterize a good fire retarding paint. In addition to discussing effect of several chemicals on fire retardency of paint, publication describes simple method of testing the efficiency of paint.

Author discusses selection of pigment, vehicle and coating, solvent, gas producing agent, plasticizer, and concludes with listing of references and literature he has used. To obtain "Fire Retarding Paints," remit 50c direct to Chemit Company, Department CP, 247 Belmont Avenue, Brooklyn 7, New York.

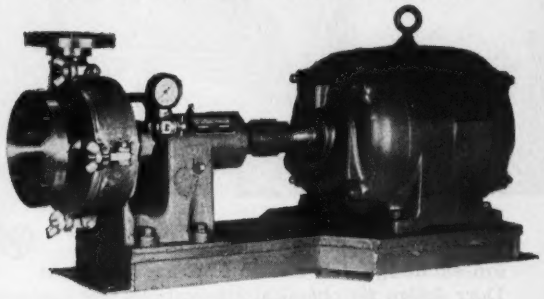

Here are the **PUMPS** that will handle ANY PRODUCT that will flow to them . . .



This model has been designed for the non-agitating, efficient pumping of milk, food products such as diced carrots, cream style corn, tomatoes, applesauce, relish and beverages. It is also practical in breweries and for the pumping of drugs and chemicals in solution.



Designed for very efficient operation at 1800 and 3600 RPM, and especially where high speeds are required, through heaters, coolers, filters, clarifiers, etc. The 3600 RPM model is especially applicable in the dairy industry, where high head and low capacity are essential and for handling low and medium viscosity liquids in the food processing industry.



Here is the model that is in demand to pump Latex, water, brine, light oils, chemicals, paints, brewery products, and liquids in the food processing field where lines are of heavy I. P. S. type. This model offers quick disassembly features for ease in cleaning.

ANY product that will flow to them can be handled efficiently and economically with Tri-Clover non-agitating centrifugal pumps. Illustrated are three of the many Tri-Clover pump models which are used for dairy and food processing, brewing and bottling, chemical and general industrial applications.

Designed for efficient liquid transmission and low cost maintenance, these pumps feature patented screw type impellers with sanitary impeller clips, inert carbon seals easily removed for cleaning, streamlined lightweight heads with a minimum of parts, and the exclusive Tri-Clamp casing construction which permits fast, easy pump assembly or disassembly.

Tri-Clover's exclusive developments are the result of over 30 years of specialized engineering experience and thorough knowledge of liquid handling. Let our engineering staff work with you in solving your pumping problems.

EXPORT DIVISION: 8 South Michigan Avenue
Chicago 3, Illinois, U.S.A.



SEND FOR THE TRI-CLOVER PUMP CATALOG—*One of the most complete, useful pump catalogs ever compiled. Contains engineering data on all types of pump applications. Write for your copy of Catalog 250 today.*

Tri-Clover®
MACHINE CO.
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

THE Complete LINE

P152

When inquiring check CP 6237 on handy form, pgs. 2-3

When you're thinking of

# ION-EXCHANGE

make Dorr's experience a part of your plan—

Equipment for the increasing use of ion-exchange techniques in the chemical process industries is being continually developed and improved by Dorr engineers. Whenever you are thinking of ion-exchange make use of our experience . . . from problem analysis to initial plant operation.



One of these developments is the ion-exchange cell shown here . . . a typical Dorr design for chemical applications. Its exclusive features provide . . .

- **Minimum dilution of solutions** treated, through use of air-dome operation with automatic level control.
- **Maximum use of cell volume** by elimination of inert supporting medium for exchange resins, through use of non-clogging under-drain distributors.

Better tools TODAY to meet tomorrow's demand

DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world.

When inquiring check CP 6238 on handy form, pgs. 2-3




***Fast repair of pipe leaks with rubber-lined metal clamp . . .***

wrap clamp around, insert bolts and then tighten

*Uses*: For repairing full breaks in asbestos-cement, cast iron and steel lines.

*Features*: No need to shut down to make repair, rapid assembly, and special inter-toothed rubber gasket insures constant gasket thickness on uneven pipe.

*Description*: CirclSeal Clamp consists of 36 oz heavy copper or 20-gage stainless steel sleeves which are lined with the above mentioned inter-toothed Lastite rubber gasket.

In repairing a leak, the following operations are performed: excavate small ditch (or clear an area), wrap CirclSeal around pipe and slip bolts through holes, draw up bolts evenly, and tighten to desired tension to seal break.

(A product of R. H. Baker & Company, Inc., Dept. CP, 2070 E. Slauson Ave., Huntington Park, Calif. . . . or for more information check CP 6239 on handy form, pages 2 and 3.)

***High-speed method for repairing holes and ruts . . .***

patched area can be put into use almost immediately

*Uses*: Repairing holes, ruts and other imperfections in concrete floors of all kinds.

*Features*: Material is very easy to use; patched area may be placed in service almost immediately.

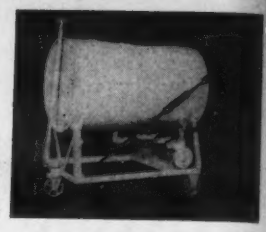
*Description*: Superset Tampatch is composed of aggregates coated with fast drying, synthetic resins and combined with asphaltic oils. To use, essentially all that is required is to clean and bond the surface to be patched, dump in the required material and tamp firmly into place.

Patch becomes smooth with moving traffic and will withstand extremely heavy loads.

The aggregate material is shipped in drums of various sizes—ready to use without mixing. When container is kept air tight, Tampatch will keep indefinitely. Bonding material is delivered separately.

(Available from United Laboratories, Inc., Dept. CP, 16801 Euclid Ave., Cleveland 12, Ohio . . . or for more information check CP 6240 on handy form, pages 2 and 3.)


# Portable Cleaning Unit Cuts Maintenance Costs



The portable Oakite Hot-Spray Unit will prove particularly useful for cleaning or paint stripping large wall or floor areas. Specifically you can pressure clean and rinse or paint strip a 12,000 square foot area in just ½ hour. You'll find the unit a big time and money-saver.

FREE FOLDER F-7608 gives you full description of the easy-to-operate Oakite Hot-Spray Unit. Send today to Oakite Products, Inc., 18F Rector Street, New York 6, N.Y.

SPECIALIZED INDUSTRIAL CLEANING

OAKITE

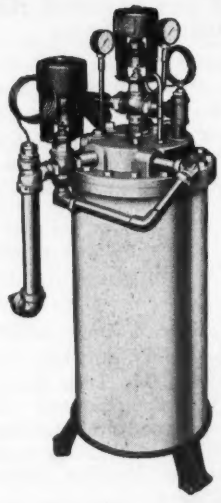
MATERIALS - METHODS - SERVICE

Technical Service Representatives in Principal Cities of U.S. & Canada

When inquiring check CP 6241 on handy form, pgs. 2-3

CONDITIONS DEMANDED—

So-COE developed . . .



## The WATER HEATER OF TOMORROW

Here is a radically different "package" water heater. • It arrives completely assembled, tested and adjusted. No accessories to buy. Simply attach pipes, then turn on water and steam. • An advanced product of high quality in every detail. • Utilizes abundant water at the safe temperature of 120° F. for washroom; or water at 160° to 180° F. direct from tank simultaneously for scalding purposes. • Seventeen sizes in capacities from 200 to 3000 G. P. M.

*Heavily glass-lined A. S. M. E. tanks.*

*MAXIMUM Thermal Efficiency.*

*All parts quickly and easily accessible.*

*Completely Insulated and Protected by Waterproof Cover.*

*Long life through minimum corrosion.*

*17 Sizes.*

*Capacities 200 to 3000 G. P. M.*

THE COE MANUFACTURING COMPANY

503 BANK STREET • PAINESVILLE, OHIO

When inquiring check CP 6242 on handy form, pgs. 2-3

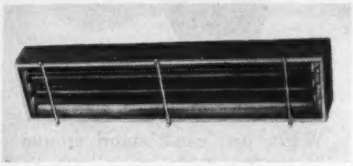
***Fluorescent inspection useful in many fields of industrial processing . . .***

ultraviolet source burns cool and starts instantly; no warm-up period required

*Uses*: Detection of flaws in metal casting and machined parts. Determination of complete coverage where transparent or hard-to-see sprays, fillers, and coatings are used on wood, rubber, plastic, and metal.

*Features*: Tubes burn cool, start instantly, and may be turned on and off at will with no warm-up period for reaching peak emission and no cooling-off period required before re-starting.

*Description*: Industrial type source covers area of 20 to 40 square feet with intense (non-injurious) long wave ultra-violet radiation. Fixture is dust-proof and vapor-proof. Equipped with spectral-finish aluminum reflector for maximum ultraviolet intensity.



Ultraviolet source uses tubes of self-filtering glass

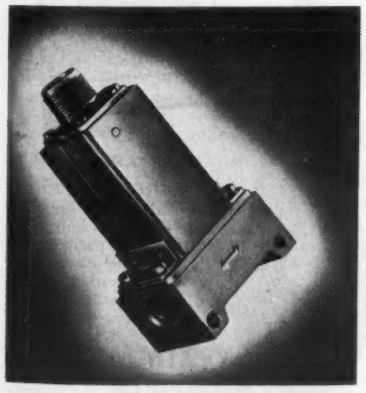
Three 40 w tubes are used which are made of self-filtering glass that increases fluorescent response so that inspection operations can be handled in normally lighted area.

(Blak-Ray ultraviolet source is a product of Ultra-Violet Products, Inc., Dept. CP, 145 Pasadena Ave., South Pasadena, Calif. . . . or for more information check CP 6243 on handy form, pages 2 and 3.)

***Even extreme back pressure does not affect operation of pilot valve . . .***

floating shear seal principle of solenoid unit also allows handling of contaminated fluid

Floating shear seal principle of solenoid pilot valve permits it to function perfectly, even under extreme back pressures or with highly contaminated fluids. Floating shear seal principle permits greater pressure range for any given solenoid. This, combined with the low pressure drop, allows use of a smaller diameter valve than is usually required in other designs.



Floating shear seal principle permits greater pressure range

Although valve has gained widespread acceptance throughout aviation system, such as in thunderjets, it is considered that design of valve can be adapted to numerous other uses.

(Manufactured by Valcor Engineering Corp., Dept. CP, Newark, N. J. . . . or for more information check CP 6244 on handy form, pages 2 and 3.)


# TYGON *Versus* ROH

PURE alcohols usually are not corrosive. However, under certain conditions, in aqueous solutions, or in combination with other chemicals, they can and do give trouble. Alcoholic solutions of acids and bases, tinctures, and the use of denaturants offer a complicated picture of corrosive attack. Additionally, the organic nature of alcohols warrants special consideration in their use with the TYGON family of plastic compounds.

The TYGON family is a series of vinyl based compounds — selected polyvinyl resins carefully modified with other materials to give the maximum in general chemical resistance and physical properties. There are a number of standard and special compounds available in the form of calendered or press-polished sheeting, molded goods, extrusions, paint and plastisols. Some are non-toxic, others are not. Some are glass-clear, some are glossy black, still others are available in practically any color. A wide range of physical and mechanical properties are exhibited. Many different types of applications are possible.

In any of its forms, TYGON displays excellent resistance to both simple and polybasic alcohols in any concentration. Service temperatures are limited only by the boiling points of the alcohols involved. Where alcohols are used in combination with other chemicals, preliminary tests or the counsel of U. S. Stoneware engineers is advised. In these cases, the particular additives used govern the suitability of TYGON and its service limits.

Because of the organic nature of the two materials, a certain amount of trace extraction takes place whenever TYGON is used in full contact with alcohols. The total extraction is very low — almost negligible. It usually results in a slight hardening and stiffening, a slight loss of weight and a slight color change. Generally speaking, these changes are barely noticeable and do not affect the protectability of the TYGON.

Another factor to remember in the use of TYGON with alcohols involves its use with tinctures. Occasionally, the color of the material in solution is imparted to the TYGON. Once again, however, the protectability and functioning of the TYGON is unaffected excepting where solution visibility is important.

TYGON as calendered or press-polished sheeting is used primarily to line and cover all types of process equipment. It also is die-cut into gaskets, seals, and separators for a wide variety of uses.

In molded form, TYGON has even wider application — a range of uses limited only by the size and shape that can be imparted to a thermoplastic material by mold and press.

In the form of extrusions, TYGON's major use is as flexible tubing and piping. In both plant and laboratory, strong, light, glass-clear, and fully flexible TYGON Tubing has done much to simplify the problem of transmitting corrosive liquids, gases, or semi-solids. Extruded solid cord and channel also find use as gasketing, expansion jointing, and packing.

As a paint, TYGON is used to protect equipment, structural steel, walls, and ceilings against corrosive fumes and spillage. As a plastisol, TYGON is used as a heavier duty coating and in the casting or "slush" molding of flexible parts and fittings.

For most applications, TYGON in its various forms is a very practical material for use with alcohols and mixtures of alcohols with other chemicals. Occasionally, limits may be imposed by the added chemicals or by the need for absolute purity. However, these are isolated cases. TYGON can be safely regarded as an economical and effective material of construction, medium of transmission and protective coating for use with alcohols.

TYGON plastics

*In addition to TYGON in its various forms, we also manufacture a number of other materials capable of handling alcohols and their mixtures with other chemicals in any concentration and under all types of operating conditions. These products include chemical stoneware and porcelain, acid proof brick and cements, homogenous lead linings, and other organic linings and coatings.*

*Why don't you submit your corrosion problem today? There's no obligation and we'll be pleased to be of assistance. So write, now!*

420

**THE UNITED STATES STONEWARE CO., Akron 9, Ohio**

ENGINEERS, MANUFACTURERS, ERECTORS OF CORROSION-RESISTANT EQUIPMENT SINCE 1865

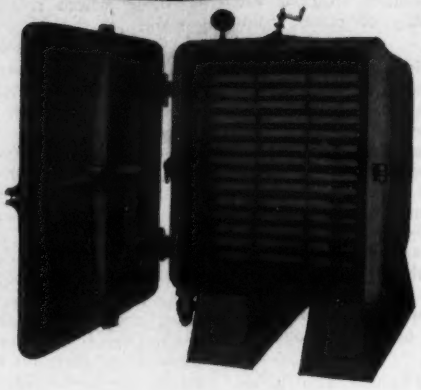
When inquiring check CP 6245 on handy form, pgs. 2-3

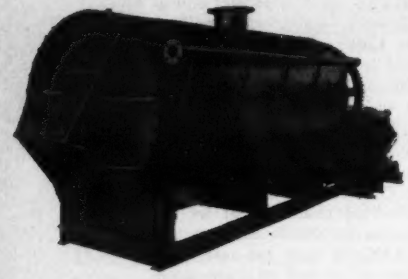
Devine

POSITIVE CONTROL PERFECT UNIFORMITY

**VACUUM CHAMBER DRYER**

Devine Vacuum Chamber Dryers are designed to dry drugs, foods, chemicals and other materials that must not be subjected to high heat, or agitated or broken while drying. Material is dried on heated shelves under vacuum. Heat and vacuum can be regulated, providing positive control of drying process. Available in either cast iron or fabricated steel.





**VACUUM ROTARY DRYER**

Devine Vacuum Rotary Dryers consist of a jacketed steel shell equipped with a revolving paddle or ribbon-type agitator with or without a central heating tube. Designed for low-temperature drying of materials that may be mixed or tumbled while drying, they may also be used for solvent recovery

*Devine Engineers, as specialists in drying equipment, have found the answer to many a tough drying problem. If there is a drying step in your process, they can help you. Inquiries invited.*

**J. P. DEVINE MFG. CO., INC.**
49th STREET AND AVRR PITTSBURGH 1, PENNSYLVANIA

**Devine**
**PROCESS EQUIPMENT**

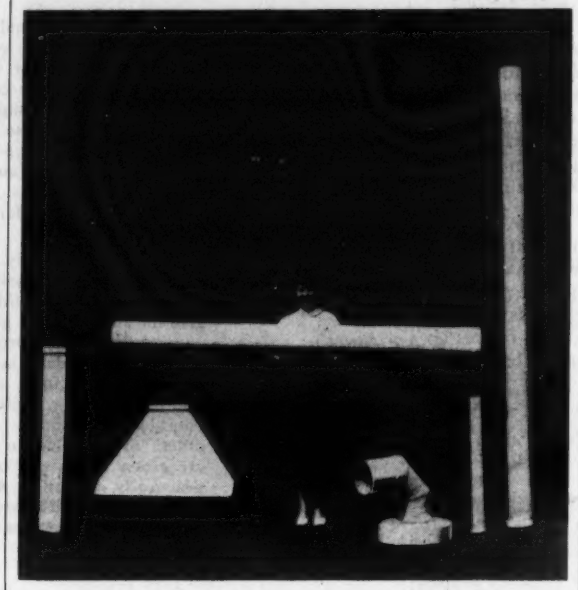
When inquiring check CP 6246 on handy form, pgs. 2-3


***Good acid resistance offered in plastic fume ducts and hoods . . .***

glass reinforced resin combination possesses strength of light metals, yet weighs much less

*Uses*: Units are suitable for ventilating open process tanks and similar applications, being manufactured in accordance with latest recommendations of American Standards Association.

*Features*: Glass reinforced resin combination provides good acid resistance outside as well as inside. In this way maintenance costs are reduced and possibility of mechanical damage minimized. This material possesses strength of light metals and is much lighter in weight.



Round and rectangular duct sections and fume hood constructed of glass reinforced resin

*Description*: Solid Plastic corrosion-proof fume ducts, hoods, and accessory equipment are constructed of Rigidon (Polyester glass combination) as well as Rigivin (rigid vinyl type), and Rigidene (Polyethylene type).

Glass reinforced resin material will withstand operating temperatures in excess of 200°F. Installation is facilitated by light weight and simple method of forming field joints. Units are standardized in both round and rectangular duct sections and hood designs.

(Product of Heil Process Equipment Corp., 12901 Elmwood Ave., Dept. CP, Cleveland, Ohio . . . or for more information check CP 6247 on handy form, pages 2 and 3.)

***Blind joints and record lengths are firmly bonded with silver brazing materials . . .***

base metal strips eliminate voids and oxide islands, cut fluxing and cleaning time

*Uses*: Typical applications include brazing joints of large area, pressure tight joints in high pressure pipe lines, and blind joints. Other uses pertain to joining powder metal parts, for honeycomb structures, for joints of very high strength, and for electrical contacts. Strips are used

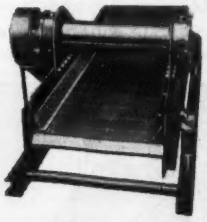

**EFFICIENT DEWATERING**

**BEE-ZEE ROUND ROD SCREENS MAKE IT EASY**

Water just can't stand around on BEE-ZEE screens. That's because exclusive round rod design (with some help from the law of gravity) keeps the water rolling downward where it belongs . . . keeps it out of your coal cars where it can cause exasperating, expensive winter freeze-ups.

**HERE'S ANOTHER MONEY-SAVING ROUND ROD FEATURE:**

Round rods maintain accuracy even when worn halfway through . . . adding extra months of performance . . . providing a greater time span between shutdowns for installation.



**ADAPTABLE TO ANY SCREENING JOB**

BEE-ZEE screens can be designed and built to solve your particular screening job. Send us your requirements. No obligation *Write for Free Catalog.*

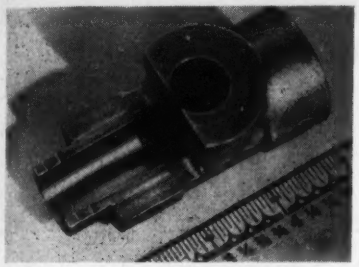
BIXBY-ZIMMER *Engineering Co.*
760 ABINGDON STREET, GALESBURG, ILL.

**BEE-ZEE SCREENS CAN BE FITTED TO ANY SCREENING EQUIPMENT**

When inquiring check CP 6248 on handy form, pgs. 2-3

to join most ferrous and non-ferrous metals, similar as well as dissimilar.

*Features*: Base metal strips permit achievement of flawless blind joints and joints of long cross-section without reliance upon the skill of operator. Product also eliminates voids and oxide islands. Joints are produced that are effective over 100% of bonding area, not just 50 to 70%. Fluxing and cleaning time is cut. Assembly set-ups are simplified by making conventional preplacements unnecessary.



Cut-away section of high-pressure hydrogen line, showing flawless joint of unusual length made with base metals strip. Note complete penetration of silver brazing alloy joint

*Description*: Braze-Clad metals are combinations of various base metals (ferrous and nonferrous) clad with a predetermined thickness of silver brazing alloy on one or both sides. Brazing alloy, which is available in wide selection of melting points, is pre-diffused into surface of base metal by application of heat and pressure. Metals were developed to overcome failure of joints brazed in conventional way.

Among drawbacks eliminated are balling-up in first stages of heating, and uneven, unpredictable spread. Since it is no longer necessary to depend on capillary creep, longer joints are possible and heating cycle is shortened. Complete penetration of joint by silver brazing alloy is achieved, in comparison with only 33 1/3% by conventional methods.

Since brazing alloy on metal strips is anchored to base metal, flow of molten alloy is closely controlled. This does away with extensive after-brazing operations to remove unwanted overflow, burrs, or fillets. Product is available in large variety of metal bases, with silver brazing alloy on one or both sides of any specified thickness or melting range. Strip can be blanked, stamped, or formed — just as if silver alloy were not present.

(Developed by American Silver Co., Inc., Dept. CP, 36-07 Prince St., Flushing 54, N. Y. . . . or for more information check CP 6249 on handy form, pages 2 and 3.)

### *Light-weight metal equipment in many sizes and alloys*

Many types of processing equipment fabricated from numerous alloys are illustrated in 24-page catalog. Metal heat treating, chemical, petroleum, pharmaceutical, and other processing industries will find information of interest.

Types of equipment listed include carburizing and annealing boxes, trays, fixtures, retorts, annealing covers and tubes, cyanide and lead pots, furnace tubes and parts, alloy bubble caps, welded alloy process piping, thermocouple protection tubes, and cylinder caps and neck rings. Engineering data on 270 standard styles of bubble caps and risers for fractionating towers and stills are listed. Publication also contains drawings for use in determining methods of bubble tray assembly.

Cat 52 is issued by The Pressed Steel Co., Dept. CP, Wilkes-Barre, Pa. When inquiring specify CP 6250 on handy form, pages 2 and 3.





$CO_2$ — in solid or liquid form — is saving untold dollars for the manufacturers of molded rubber products! Formerly, when small rubber articles were die-molded, it required a laborious hand operation to remove the excess rubber or "flash" squeezed out by the molding process. Today, fabricators are tumbling rubber parts with $CO_2$ — in liquid or solid form — which "freezes" and powders the thin membrane while effectively burnishing the article. What about thin sections of the molded piece? You're safe as long as wall thickness is three times that of the flash!

$CO_2$ — in solid, liquid or gaseous form — is finding wider and wider application among today's research technicians. A refrigerant . . . chemical . . . inert gas . . . pressure medium . . . and carbonation agent — it offers a unique combination of properties. Often, two or more of these properties can be employed in a single operation! Low cost and ready availability make it a natural for hundreds of heretofore untried uses in a score of industries. If you'd like further information about $CO_2$ — or specific information about its "rubber freezing" application — write today!

PURECO **PURE CARBONIC COMPANY**

*A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED*

**General Offices: 60 East 42nd Street, New York 17, N. Y.**

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AN AIR REDUCTION PRODUCT

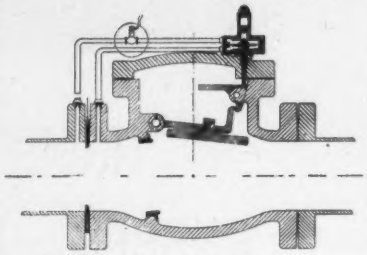
When inquiring check CP 6251 on handy form, pgs. 2-3

***Ammonia, liquefied gases instantly checked by safety valve . . .***

stops flow as soon as pressure rises above normal

*Uses*: For securing positive shut-off of anhydrous ammonia, liquefied petroleum gases, anhydrous hydrogen fluoride, and wide variety of other dangerous gases and liquids.

*Features*: Instantaneous checking of flow may be effected by installation of valve. Free process flow is permitted at normal pressures, but valve actuates as soon as flow rates are exceeded by unsafe values. Since line breaks and process upsets may be checked as they occur, safety factor in handling hazardous volatile liquids and gases is increased.



Sectional view of shut-off valve

*Description*: Sentry Balanced Diaphragm Excess Flow Shut-off Valve may be installed in a similar manner to that of any conventional fitting of same size. Orifices and downstream taps may be placed at considerable distances from valve, depending on nature of fluid under control.

Valve may be used on any line pressure up to its full rating and beyond. Normal emergency flow controls may be adjusted by use of various orifice sizes and spring adjustment.

(Manufactured by McRae Valve Corp., Dept. CP, 621 S. Spring St., Los Angeles 14, Calif. . . . or for more information check CP 6253 on handy form, pages 2 and 3.)

***Efficient cooling provided for electric motor . . .***

variable speed totally enclosed drives range from 20-25 hp

Dual system provides highly efficient internal and external cooling for totally enclosed fan-cooled electric motor. Speed-Trols, Variable Speed Electric Power Drives are available in range of 20 to 25 hp with 2-1, 3-1, and 4-1 speed variations.

Air inside motor is continuously circulated by large diameter internal

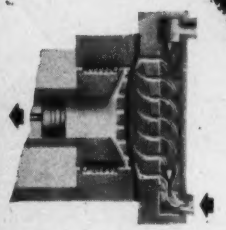




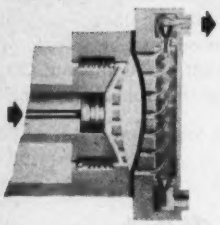
**Lapp**

*Auto-Pneumatic*

**PULSAFEEDER**



INTAKE STROKE



DISCHARGE STROKE

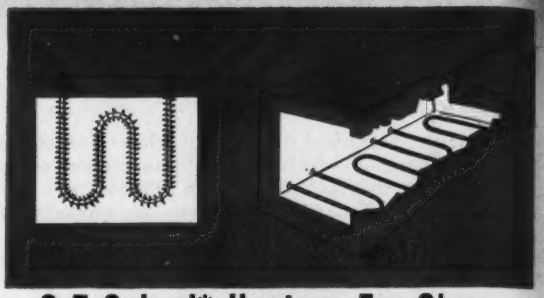
**No packing or other leak-likely gland can be in contact with chemical being handled by the Lapp Pulsafeeder. A hydraulically-balanced diaphragm acts as a floating partition, without mechanical load or pressure differential—assures isolation of chemicals being pumped from all working pump parts. Pumps against pressures to 2,000 lbs., at constant pumping speed—variable flow for continuous processing results from variation in piston-stroke length-controlled by instrument air pressure responding to any instrument-measurable processing variable.**

**WRITE** FOR NEW BULLETIN No. 300, just issued. 24 pages of description, specifications, typical applications, flow charts. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Division, 565 Maple Street, Le Roy, N. Y.




When inquiring check CP 6252 on handy form, pgs. 2-3





**G-E Calrod* Heaters For Clean, Uniform Process-Air Heating**

It's easy to heat air for ventilating systems, curing, ripening or drying rooms—install fin-Calrod heaters in ducts.

Ovens for baking, drying, dehydrating, etc. are easily and accurately heated with G-E Calrod tubular or strip heaters.

G-E heaters give accurate, uniform heat and are easy to control automatically.

**FOR FREE BULLETINS,** "Handy Selector Guide—Calculate Your Own Air Heating Needs," GEA-5685; complete catalog of heaters and devices, GEC-1005; and "Heating Process Air," GEA-5096; call your nearby G-E Sales Office or write: Section 720-75, General Electric Co., Schenectady, N. Y.

*Registered trade-mark.

GENERAL ELECTRIC

720-75

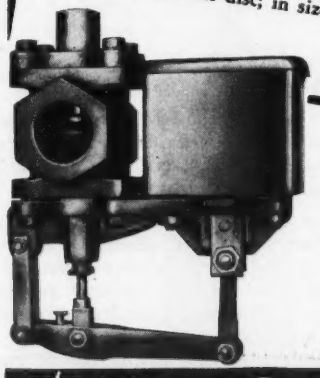
When inquiring check CP 6254 on handy form, pgs. 2-3



**JOHNSON** Direct Acting Solenoid Valve — for 150 lbs. Differential Pressure . . .

You *can* get a solenoid valve that operates under differential pressures up to 150 lbs., temperatures to 400°F., *without pilot valves*. It ends the time lag and wiredrawing that come with slow opening —the danger of sticking that comes with auxiliary pistons. It offers unusual possibilities for all types of automatic, or remote, flow control. Johnson Solenoid Valves are available for normally closed or normally open service; with stainless steel valve and seat or Jenkins disc; in sizes from ½" to 3".

*Write for Bulletin "V"*



**WHERE CAN YOU USE THIS AUTOMATIC VALVE?**

- No pilot valves
- Temperatures to 400°F.
- Differential Pressures to 150 lbs.
- Immediate full flow
- Heavy duty construction

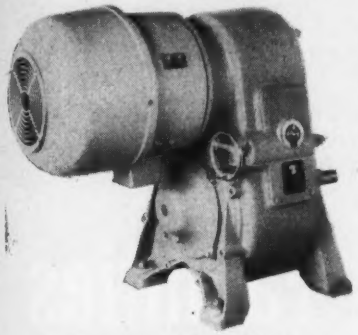
The Johnson Corporation

826 WOOD ST. THREE RIVERS, MICHIGAN

When inquiring check CP 6255 on handy form, pgs. 2-3

cooling fan through unobstructed air passages between motor housing and rotor, over motor windings, and through openings in rotor. In this way circulating air can be maintained in continuous contact with motor housing.

Maximum cooling is accomplished because heat from every part of motor is quickly transferred by triple action of convection, conduction, and radiation to outside of motor. Heat on outside is rapidly carried off by continuous flow of cooling air forced over motor housing by external fan and removable grilled fan cover.



Totally enclosed fan-cooled motor shown above is 25 hp with 4-1 speed variation

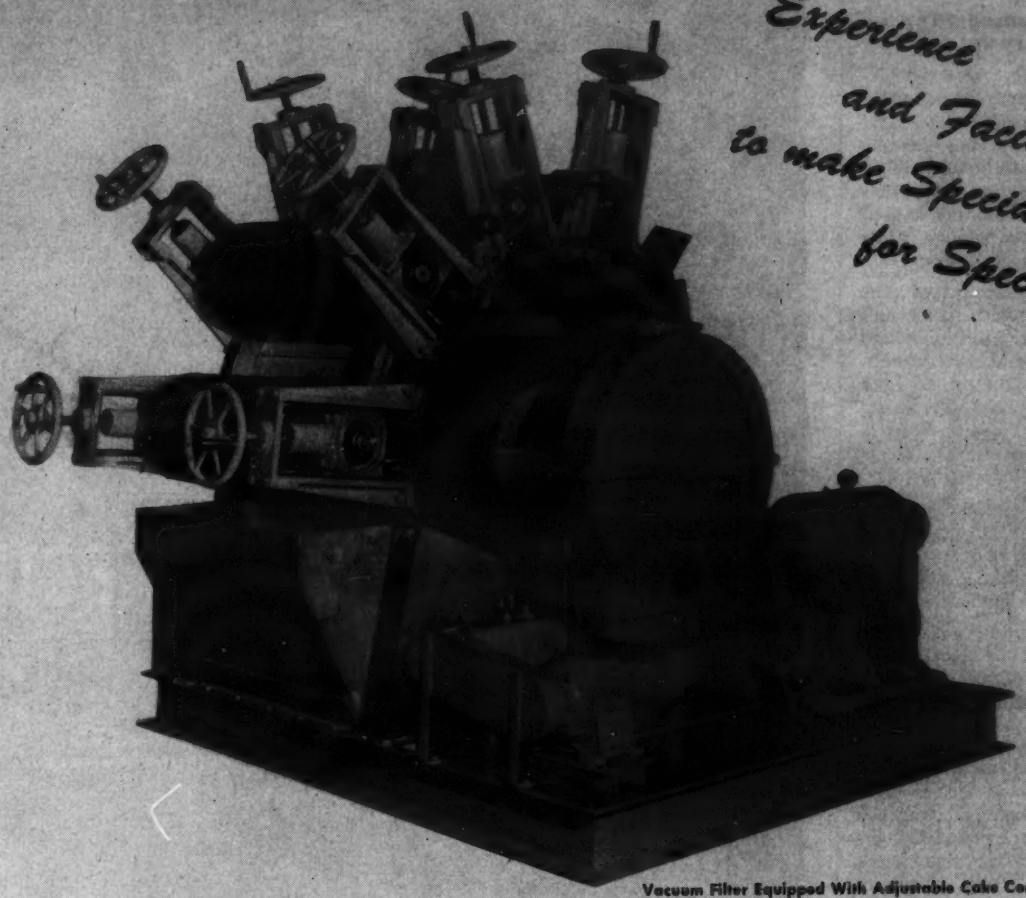
(Product of Sterling Electric Motors, Inc., Dept. CP, 5401 Anaheim-Telegraph Road, Los Angeles 22, Calif. . . . or for more information check CP 6256 on handy form, pages 2 and 3.)

### *Tours facilities to build panelboards*

Manufacturer's facilities to design and build instrument panelboards are shown and briefly described in 20-page bulletin. Booklet covers actual processing of an order, which includes analyzing the problem, design, fabrication, finishing, placement of wiring, and shipping the finished product.

Cabinet, open, sectional, and graphitrol panels are among types of instrument panelboards fabricated by manufacturer. Bul 98216 is issued by Taylor Instrument Companies, 95 Ames St., Dept. CP, Rochester 1, N. Y. When inquiring specify CP 6257 on handy form, pages 2 and 3.

For more information on product at right, specify CP 6258 . . . see information request blank between pages 2-3.

Experience and Facilities to make Special Filters for Special Jobs

Vacuum Filter Equipped With Adjustable Cake Compression Rolls.

Eimco's more than half a century of experience in building successful, special equipment to do special work for the process industries is an advantage to you when buying filtration equipment.

The extensive laboratory and field experience of Eimco's Filtration Engineers is offered to you without obligation.

Special filtration equipment for all process industries has passed the test of time. Service and dependability of Eimco equipment is an established fact.

Write for information on Eimco equipment at work on a filtration problem similar to your own.

Samples for testing filterability of a product may be sent to our laboratory for free analysis. Write for shipping instructions.

EIMCO A395

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The World's Leading Manufacturer of Vacuum Filtration Equipment

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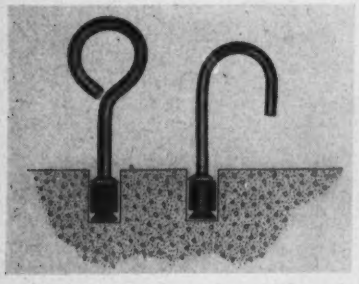
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### *Anchorage is increased 50% for pipe in masonry*

Anchorage assemblies recently developed for mounting pipe, conduit, and guy wires in masonry are said to fasten them 50% more securely than other types of anchorage. Two assemblies are offered, a pipe bolt unit and an eye bolt type. Former is used for mounting pipe and conduit while latter is for anchoring guy wires.

Super-Grip assemblies consist of pipe or eye bolt, lead sleeve, and cup-shaped anchor. After insertion of assembly in masonry, lead sleeve is mush-



Eye bolt assembly is shown at left and pipe bolt unit at right

roomed out by repeated blows on a special tamping tool. Flattening of steel anchor drives its ribbed steel edges into walls of hole. Steel anchor reinforces lead sleeve, providing permanent solid anchorage that keeps pipe or eye bolts from becoming loose.

Pipe bolt assembly replaces pipe straps, anchors, screws, and bolts. Units, which are rust proofed, can be obtained for ½, ¾, or 1" pipe. Eye bolt assemblies are also rust proofed and are available in bolt lengths to 6 inch with hole diameter of ½ inch.

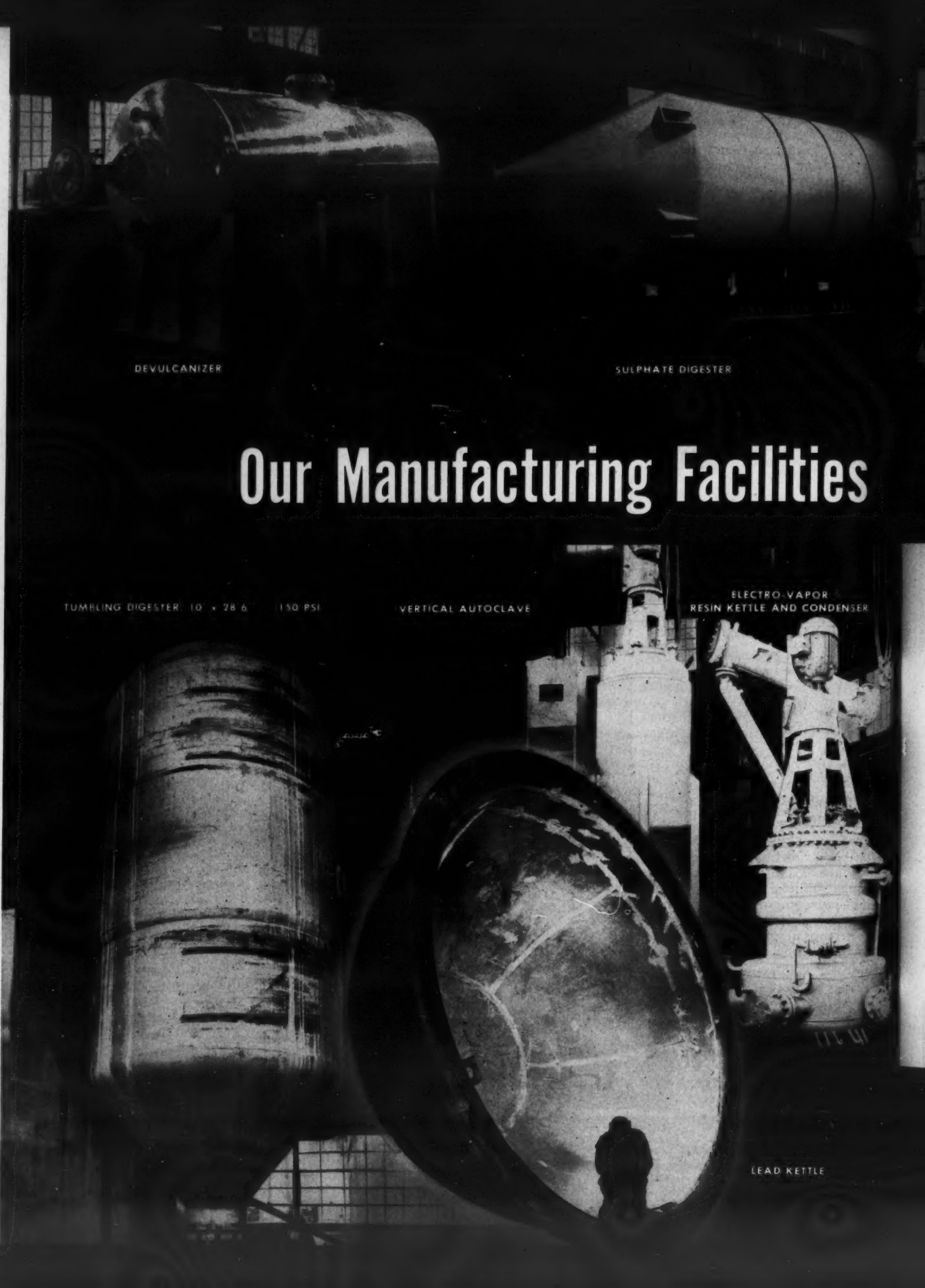
(Product of Super-Grip Anchor Bolt Company, Inc., Dept. CP, 3333 N. 22nd Street, Philadelphia 40, Pennsylvania. . . . or for more information check CP 6259 on handy form, pages 2 and 3.)

### *Single pass purifies turbine oil . . .*

automatic unit is self-contained and compact

*Uses*: For reclaiming turbine lubricating oil. Unit may be connected directly to one or more turbines for continuous operation or to storage tanks for batch purification.

*Features*: It is claimed that a 100% job in purifying the oil is accomplished in a single pass through unit. Reclaimer is supplied in a compact, self-contained package including





JACKETED VULCANIZER WITH BLAW-KNOX QUICK OPENING DOOR

HORIZONTAL AUTOCLAVE WITH BLAW-KNOX QUICK OPENING DOOR

# IMPROVED to meet all modern needs!

**EXTENSIVE** modernization of plant and procedures enables us to build virtually any type or size of processing equipment to fulfill your requirements. Improvements include new equipment for rolling and shaping larger, heavier sheets and plates, improved X-ray equipment and new tooling throughout our shops. High-quality Blaw-Knox Process Equipment now costs no more than ordinary equipment. Take advantage of Blaw-Knox years and years of successful experience in serving the processing industries . . . for complete information write for Bulletin 2403.

*Process Equipment Department*

**BLAW-KNOX DIVISION of Blaw-Knox Company**

**2076 Farmers Bank Bldg., Pittsburgh 22, Pa.**

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**HIGH QUALITY EQUIPMENT FOR:**

Distillation • Cracking
Gas Cleaning
Solvent Extraction
Solvent Recovery
Heat Transfer
Gas Absorption
Polymerizing • Evaporation
Crystallization • Impregnating
High Pressure Processing

# BLAW-KNOX PROCESS EQUIPMENT


all accessories such as pumps, motor, heater, and heat exchanger.

*Description*: Hilco Oil Reclaimer provides for automatic operation at low temperature under vacuum. Unit requires infrequent attention and has low labor and operating costs. No oil is handled by operator nor is any oil discarded.

Method of purification consists of dirty oil flowing to a pump which delivers it through a heat exchanger to a preheater and through a bed of filtering material. For processing straight run mineral oil, Hilite (Fuller's earth) is used for filtering medium. When filtering oil containing additives, such as oxidation and rust inhibitors, Adstay filter disks are used. This is a cellulose product.

After filtration, oil flows into an evaporating chamber where all traces of water and moisture are removed. All solid matter and acids are retained in filtering material.

Next stage is for oil to flow to exchanger where it transfers heat to cold incoming oil. Purified oil then goes to pump and back to turbine reservoir or clean oil tank. Settling tanks and pretreatment of oil are eliminated in process.

(Introduced by The Hilliard Corp., Dept. CP, 58 W. Fourth St., Elmira, N. Y. . . . or for more information check CP 6260 on handy form, pages 2 and 3.)

***Illustrated booklet of cork products***

Four-page bulletin contains specifications and description of cork products and compositions. Information on structure of cork, natural cork products, cork compositions, physical characteristics, and typical products made from both natural cork and cork compositions is included.

Tabular data on density, tensile strength, compression, and coefficient of friction of natural cork are listed. Physical properties, characteristics and uses, sheet sizes, thicknesses, and government equivalents are presented for typical cork compositions.

"Dodge Industrial Cork Products" is issued by Dodge Cork Co., Inc., Dept. CP, Lancaster 19, Pa. When inquiring specify CP 6261 on handy form, pages 2 and 3.

For more information on product at left, specify CP 6262 . . . see information request blank between pages 2-3.



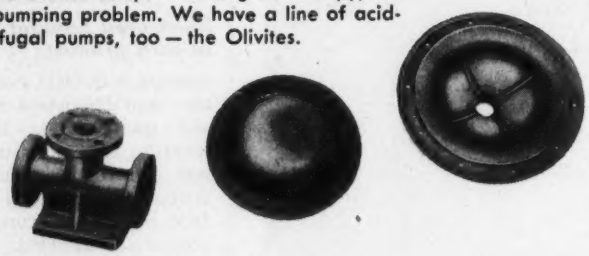
**ODS Diaphragm SLURRY PUMP**

**Every Contact Inch Highly Corrosion Resistant**

**ODS** Pumps are available, of course, unlined for handling non-corroding slurries or solutions but when protection is necessary, all contact surfaces are lined with rubber or neoprene.

So, if you have a pumping problem that calls for a diaphragm pump—regardless of the pH involved—get all the facts about the O.D.S. It can handle just about any slurry or solution found in industry. And it has one of the best low-maintenance features to be found among all pumps: a no-linkage, hole and slot-free diaphragm. Compressed air or vacuum actuates the diaphragm.

Our Bulletin 309-R—recently issued—gives all the latest details about the O.D.S. Pump. In writing for a copy, tell us about your pumping problem. We have a line of acid-handling centrifugal pumps, too—the Olivites.



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When inquiring check CP 6263 on handy form, pgs. 2-3

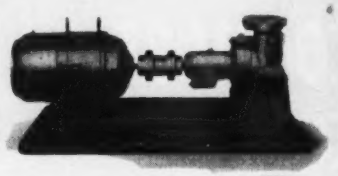

***Packing difficulties eliminated through use of mechanical shaft seal on pumps . . .***

dependable operation provided by balanced impeller and generous ball bearing design

*Uses*: For handling light liquids at temp to 250°F.

*Features*: Distinctive feature of pumps is that they are designed around use of a Cameron Mechanical Shaft Seal as standard equipment. Use of shaft seal is solution to problem of stuffing box leakage. Packing difficulties are eliminated and maintenance minimized. Long service life is insured by a balanced impeller that has efficient, renewable double wearing ring sealing around its suction side. Radial ribs on back shroud of impeller decrease pressure on seal chamber, a factor which reduces wear on seal faces. Generous ball bearing design also assists in providing dependable operation.

*Description*: In development of Class SFLA pumps, same hydraulic design was employed as in company's existing single-stage, vertically split process pump line. Adequate provision for flushing and draining mechanical seal is provided, lengthening seal life when handling dirty or abrasive liquids. Use of shaft seal also reduces overall shaft length, giving increased rigidity and strength to rotating element and decreasing shaft overhang.



Process pump employs mechanical seal as standard equipment

Tight seal against leakage into or out of bearing housing along shaft is assured by Neoprene shaft closure and flinger between housing and seal chamber. Pumps, which are compact and space saving are built in 1, 1½, 2, 3, and 4" sizes. Capacities are up to 1000 gpm and pressures to 600 psi.

(Product of Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, N. Y. . . . or for more information check CP 6264 on handy form, pages 2 and 3.)

**A company name and address . . .**

*at the end of each editorial article makes it easy for you to follow-up on process-improving ideas you read about in these columns . . . saves you time. Write direct or use the handy Reader Service slip.*

THE EDITORS

***Perfect threads are insured with tapping attachment on drill press . . .***

screw and nut assure uniform pressure to tap, whether operator hits too hard or too soft

*Uses*: As attachment to standard drill press used to tap threads on parts.

*Features*: Auto-Tap has split nut and matching lead screw which prevent greater or lesser exertion by operator from being passed on to tap. This insures clean and perfect thread. It also removes load and strain from tap, since tap only does actual cutting.


**NEW Swagelok THERMOCOUPLE CONNECTOR**



**Standard Swagelok Tube Fittings in fractional sizes are now available for holding thermocouples.**

**Thermocouples or dip tubes are easily handled with these new Swagelok Connectors. They can be furnished in a wide variety of sizes from 1/8" up in brass, aluminum, steel, stainless steel and Monel.**

**Latest catalog showing complete line of Swagelok Fittings will be sent on your request to Dept. 44.**

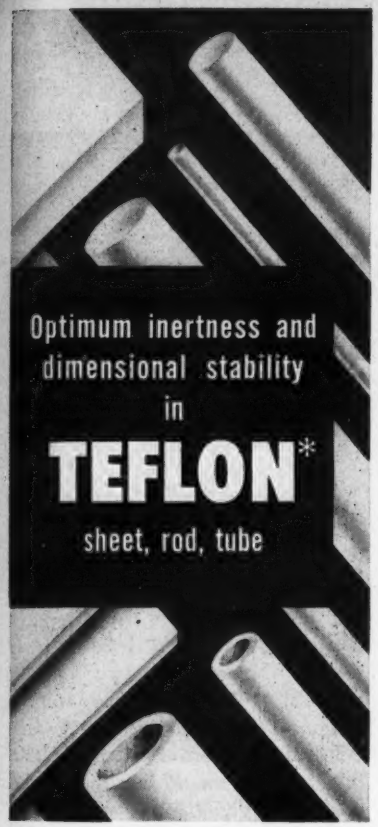
**CRAWFORD FITTING CO.**
**884 E. 140th Street, Cleveland 10, Ohio**

**SWAGELOK FITTINGS AVAILABLE IN: BRASS, ALUMINUM, STEEL, STAINLESS STEEL, MONEL**




**COME TO YOU COMPLETELY ASSEMBLED, FINGER TIGHT**

When inquiring check CP 6265 on handy form, pgs. 2-3




*. . . a complete stock of sizes, too, all with*
***FLUOROFLEX®-T***

Fluoroflex products are processed in new equipment engineered especially for converting "Teflon" powder. Users have found this makes a big difference two ways:

(1) The Teflon develops optimum properties. Fluoroflex products therefore withstand virtually all chemicals at −110° to +500°F.

(2) Fluoroflex-T is stress-relieved Teflon. Parts therefore maintain dimensions after machining—and show the least dimensional change under operating pressures. Free from cracks and porosity, Fluoroflex-T rods, sheets and tubes are uniform in density and strength—and machine easily.

For the ideal material for gaskets, packings, bearings, or for piping in contact with severe corrosives, investigate Fluoroflex-T. Write or phone for more information and for technical bulletin.

**DuPont trade mark for its tetrafluoroethylene resin*
**Resistoflex trade mark for products from fluorocarbon resins*

**RESISTOFLEX**
**CORPORATION**
**Belleville 9, New Jersey**

When inquiring check CP 6266 on handy form, pgs. 2-3


*Description*: Auto-Tap is attached by supporting arm to standard 14 to 15" drill presses having 2-¾" diameter column. Lead screw and nut pass through end of supporting arm at right angle and serve to control drive of the tap. This unit is held in the chuck of a reversing head, thereby providing "fool-proof" means of tapping threads.

Following variety of pitches are available from stock: 20, 24, 28, 32, 36, 40, 44, 48, 56, and 64. Split nuts with lead screws are furnished as separate units in any quantity or size desired. Special pitches and sizes of support arm are also available.

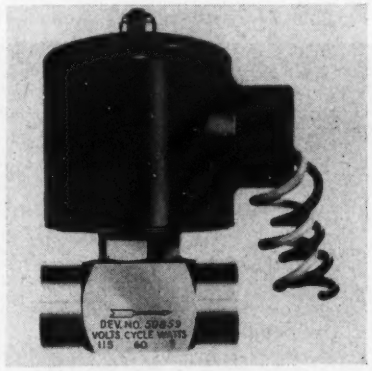
(Product of Automatic Methods, Inc., Dept. CP, 42 Walnut St., Newark, N. J. . . . or for more information check CP 6267 on handy form, pages 2 and 3.)

***Moisture-resistant coil design assures long performance of solenoid valve . . .***

two body styles and two types of needle and seat construction provide wide adaptability

*Uses*: For a wide range of industrial applications. Valve can be used for air, oil, water, gasoline, alcohol, detergents, refrigerants, butane, propane, or other non-corrosive liquids and gases.

*Features*: Long valve performance and protection against coil burnout are said to be assured by moisture and frost-resistant coil construction. Ample lift is provided by overpowered coil — even at 85% of rated voltage. Operation is very quiet, with no perceptible hum or vibration. Entire plunger assembly may be removed for inspection or cleaning. Installation is facilitated by conduit connection in cover, which can be rotated to any desired position merely by loosening cover nut. Unit has unusually wide adaptability inasmuch as it is being offered in two body styles and with two types of needle and seat construction.



Solenoid valve operates quietly

*Description*: Where positive seal-off is refurnished with synthetic resilient disk-type needle, seating against a stainless steel orifice. This is reported to provide "bubble-tight" operation under the most severe conditions.

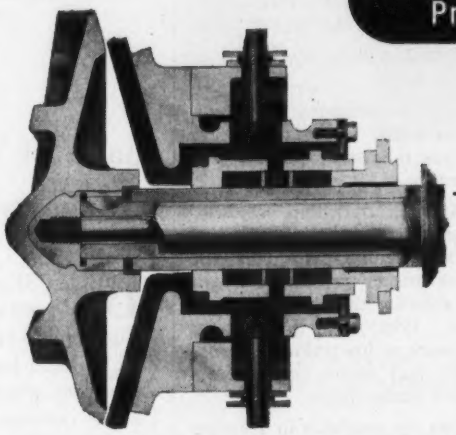
For other applications, valve is furnished with stainless steel needle, in combination with high-strength, corrosion-resistant stainless steel valve seat. This design prevents "ovaling" and wire-drawing of seat, even after long periods of continuous operation.

Unit is available with ⅜" female pipe or ½" OD tube sweat connections. Capacity on water is 78 gph and on refrigerant applications one ton Freon 12. Working pressure is up to 300 psi. Operating differential: liquid lift up to 130 psi, air and gases 250 psi, refrigerants 200 psi.

(Manufacturerd by A-P Controls Corp., Dept. CP, Milwaukee 45, Wis. . . . or for more information check CP 6268 on handy form, pages 2 and 3.)


**OLIVITE**
**Acid-Handling**
**PUMP**

How It Answers the Problem of Leakage



Illustrated is the stuffing box assembly of the Olivite Acid-Handling Pump.

Since pump leakage is probably the Number 1 Enemy when handling corroding solutions, note how in the Olivite Pump, extra precautions are taken to prevent leakage:

1. The stuffing box floats on two rubber rings which permits shaft and packing movement. The packing is not crushed nor is the replaceable shaft sleeve scored.
2. The lantern ring permits circulation of the lubricant, water, solution, or grease.
3. The resilient packing is of acid-resisting material styled for long life.
4. Simple spring loaded wing nut adjustment permits application of correct and proper pressure by the yoke on the gland and packing. No "monkey" wrench required.

Thousands of Olivite Acid-Resisting pumps have been supplied the Process Industries during the past 20 odd years. The values of these years of design, manufacturing and operating experience are embodied in every 1¼", 2" or 4" Olivite Pump you purchase.

Bulletin 308-R provides full details. When writing us please outline your pumping problems.

New York 18 – 33 W. 42nd St. Chicago 1 – 221 N. LaSalle St.
Oakland 1 – 2900 Glascock St. San Francisco 11 – 260 Calif. St.
Export Sales Office – New York • Cable – OLIUNIFILT
FACTORIES: Hazleton, Pa. Oakland, Calif.

**OLIVER UNITED FILTERS DUF INC.**

**WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES**

CANADA
E. Long, Ltd.
Orillia, Ontario

MEXICO & CENT. AMERICA
Oliver United Filters Inc.
Oakland, Calif.

INDIA
Dorr-Oliver (India) Ltd., Bombay

EUROPE & NORTH AFRICA
Dorr-Oliver S. A. Brussels
Dorr-Oliver S.N.a.R.L. Paris
Dorr g.m.b.h. Wiesbaden (16)
Dorr-Oliver Co., Ltd., London, S.W.
Dorr-Oliver S.a.R.L. Milano
Dorr-Oliver, N.V. Amsterdam-C

PHILIPPINE ISLANDS
E. J. Nell Co.
Manila

HAWAIIAN ISLANDS
Honolulu
A. R. Duvall

WEST INDIES
Wm. A. Powe — Havana

SOUTH AMERICA & ASIA
The Dorr Co.
Stamford, Conn.

AUSTRALIA
Hobart Duff Pty., Ltd.
Melbourne

SOUTH AFRICA
E. L. Bateman, Pty., Ltd
Johannesburg, Transvaal

When inquiring check CP 6269 on handy form, pgs. 2-3

***Flame uniformity is feature of fluted burners designed for natural gas . . .***

hatchet-shape flame is also ideal for applications requiring intense localized heat

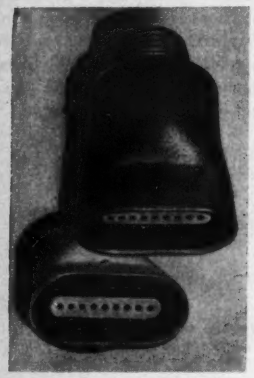
*Uses*: Burners are designed specially for natural or any slow burning gas such as tank gas. Units facilitate conversion of burner manifolds in areas where natural pipe line gas has become available.

A specific application is employment in hand torches, ribbon burners, and sealing burners as used on glass working machines for production of electronic tubes, light bulbs, neon signs, vacuum bottles, and television tubes.

Burners are also used for localized heating operations or silver soldering in the metal industry.

*Features*: Construction provides maximum flame uniformity for slow burning natural gas. Burner tips give chisel-like, fishtail type of flame of intense heat localized as desired within any limited area.

*Description*: Extra channels are supplied in NS Fishtail Burners to accommodate air flow required for desired burning characteristics when using natural gas. This type of slow burning gas requires a greater percentage of air in mixture than manufactured gas. Pilot holes burn air-gas mixture at low velocity to support and retain flames from main center holes.



**Additional channels in burner provide optimum air-natural gas mixture**

Units are available in a variety of sizes with from four to fourteen jets and maximum flame length usually varying from 2 to 2½". Dimensions of burner are from approximately 1 to 1½" in length and from ⅝ to 1¼" in width. It is advisable for those formerly using manufactured gas to employ a larger size burner with natural gas. Construction is normally of brass although units can also be supplied with heat resisting metal for use with oxygen and gas.

(Introduced by Research Vacuum Supply Co., Dept. CP, 3434 Montrose Ave., Chicago 18, Ill. . . . or for more information check CP 6270 on handy form, pages 2 & 3.)

***On-the-job molding speeds covering of valves and fittings with insulation . . .***

cork and rubber combination is flexible, can be applied in various thicknesses and in all shapes

*Uses*: For insulating fittings for cold lines. Can be used in any application where regular cork fitting covers can be applied.

*Features*: Allows on-the-job fabrication by molding with the hands to any desired thickness and over any shaped fitting. Can also be removed from a fitting and reused without loss of insulating efficiency or workability.

*Description*: Plasticork is a tacky, moldable granulated cork-and-rubber composition furnished in bulk form. It is non-corrosive on contact with all ordinarily used metals. The composition contains 80 per cent cork particles by

# PYREX® brand "Double-Tough" glass pipe gives Berkeley Chemical Corporation* great processing flexibility

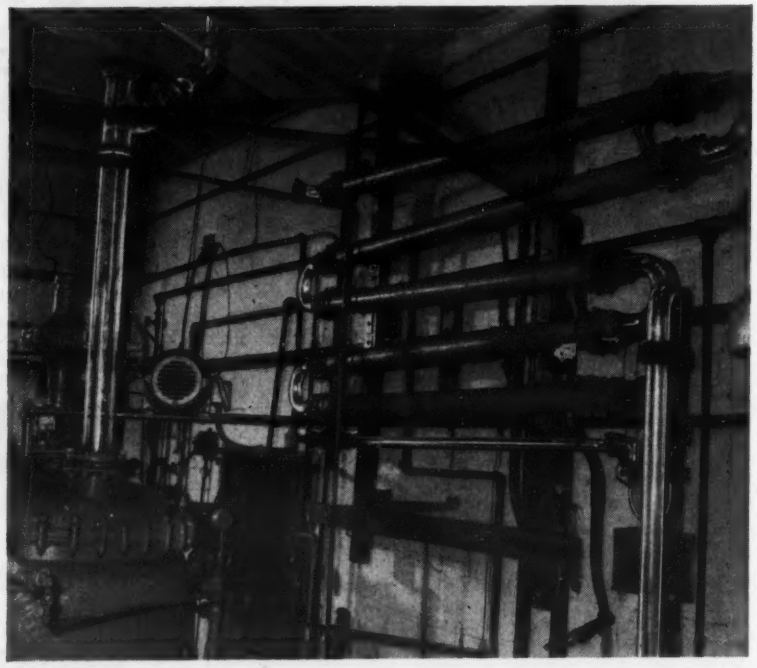
## Corrosion resistance, visibility, ease of cleaning and assembly important to economical production

BECAUSE of the variety of chemical products handled, Berkeley Chemical Corp.,* Berkeley Heights, N. J., has long recognized the fact that only glass would withstand its more corrosive materials, provide the visibility necessary to check processes continuously, provide ease of cleaning, and make frequent rearrangements of condenser and gravity separator elements a simple matter.

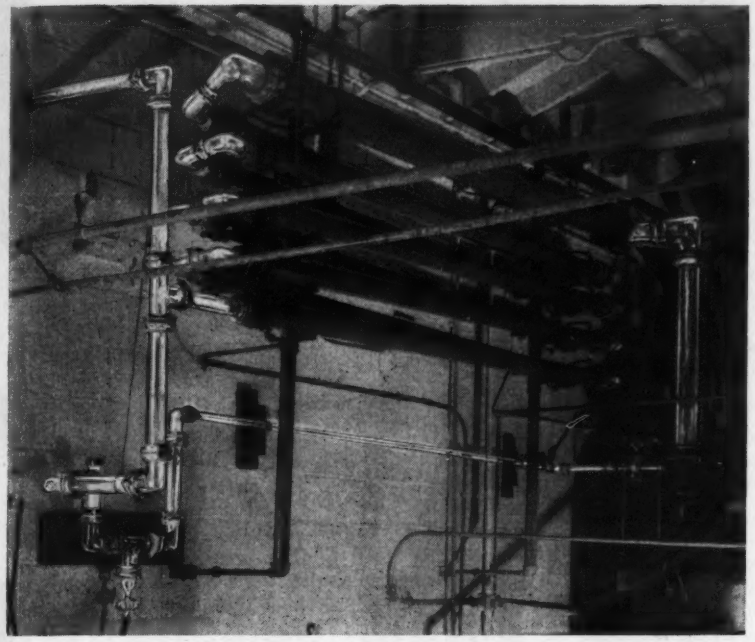
The raw materials handled include organic acids and three notorious corroding agents — iodine, chlorine, and bromine. Solvents used in the various processes include sulfuric and hydrochloric acids, benzene, toluene, chloroform, alcohol, xylene, acetone and, at the far end of the scale, a variety of caustics.

Dr. Sidney Beinfest, Vice President of Berkeley, says that "PYREX pipe and heat exchanger glass is not affected by anything the company has ever put through them. In fact, the use of glass makes practical the processing of any probable combination of chemicals in the pharmaceutical and intermediate fields. The effect of this single fact makes the company confidently willing to tackle anything within the reach of its sales organization — Millmaster Chemical Corp."

*An affiliate of Millmaster Chemical Corp.



**This picture shows a glass air condenser connected to the reaction kettle for an iodination process. Iodine which crystallizes on the wall of the vertical 4" glass tube is recovered and returned to the process. On the wall to the right is a specially designed jacketed PYREX water-cooled condenser made of 2" pipe and U-bends. Change over to the wet condenser can be made in 20 to 30 minutes. Mike Zelkind, Production Engineer, stated that most of the U-bends and all of the pipe in this condenser are over 5 years old. Mechanical failure has averaged one in two years, and that was due to lack of flexibility in the wall mounting.**



The specially designed condenser shown in the top center of this picture includes a top run of 4" x 10' PYREX heat exchanger tubing, and 8 2-inch diameter PYREX tubes. Jackets are stock pieces of black iron pipe. Standard PYREX stuffing boxes make the seals. Note that instead of U-bends at the ends of the tubes, connections are formed of 2" PYREX 90° elbows to increase flexibility. Note also the loose-hung suspension system of this unit for protection against vibration. Gaskets are Teflon. To date the only maintenance has been occasional gasket replacement. Gasket replacement takes "less than 5 minutes."


**The PYREX pipe distributors listed below carry the complete line**

***Contact the one nearest you:***

**BELMONT, CALIFORNIA**
Glass Engineering Laboratories

**FRESNO 17, CALIFORNIA**
Valley Fdy. & Mach. Works

**NEW HAVEN, CONNECTICUT**
Macalaster Bicknell Company

**ATLANTA, GEORGIA**
Southern Scientific Company

**CHICAGO 44, ILLINOIS**
Fred S. Hickey, Inc.

**NEW ORLEANS, LOUISIANA**
W. H. Curtin & Company

**CAMBRIDGE 39, MASS.**
Macalaster Bicknell Company

**ST. LOUIS 4, MISSOURI**
Stemmerich Supply Company

**LODI, NEW JERSEY**
Mooney Brothers Corporation

**ALBANY 5, NEW YORK**
A. J. Eckert Company

**BUFFALO 13, NEW YORK**
Buffalo Apparatus Corp.

**ROCHESTER 3, NEW YORK**
Will Corporation

**HATBORO, PENNSYLVANIA**
Sentinel Glass Company

**PITTSBURGH 19, PA.**
Fisher Scientific Company

**HOUSTON 7, TEXAS**
W. H. Curtin & Company

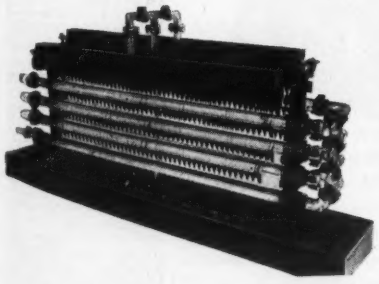
**SEATTLE 4, WASHINGTON**
Scientific Supplies

**TORONTO, ONTARIO, CAN.**
Fisher Scientific Co., Ltd.

**MONTREAL 3, QUEBEC, CAN.**
Fisher Scientific Company, Ltd.

**VANCOUVER, B. C.**
Scientific Supplies

## PYREX brand Cascade Coolers . . .
## the efficient, economical way to cool corrosives



IN practically every application involving the cooling or condensing of corrosive liquids, standard PYREX brand cascade coolers will provide the efficient, economical solution. Exceptionally resistant to virtually all acids, they assure long service life and protect sensitive products. Further economies result from the use of low-cost river or sea water as a coolant.

Low in first cost per BTU transferred, they also cost less to clean and maintain. Unusual versatility of mounting on walls, floor and ceiling saves space. And you get maximum heat transfer through thin but sturdy walls.

**CORNING GLASS WORKS**
**Dept. CP-11, Corning, N. Y.**

Please send me the printed information checked below:

- ☐ "PYREX brand Glass Pipe in the Process Industries" (EA-1)
- ☐ "PYREX brand "Double-Tough" Glass Pipe and Fittings" (EA-3)
- ☐ "PYREX Cascade Coolers" (PE-8)

Name_____

Title_____

Company_____

Street_____

City_____

Zone_____ State_____


When inquiring check CP 6271 on handy form, pgs. 2-3



Molds over irregular shaped fittings at desired thickness

volume so that it results in fitting covers whose over-all heat loss is comparable to cork fitting covers, manufacturer reports. The material is packed in cardboard containers 5, 10, 20, and 40 lb. Either twine or friction tape may be used to hold the insulating material in place after it has been applied to the correct thickness and before the application of the finish.

(Developed by Armstrong Cork Co., Dept. CP, Lancaster, Pa. . . . or for more information check CP 6272 on handy form, pages 2 and 3.)

***Solenoid controls opening and closing of valve in suction line . . .***

valve opens when machine being vented is turned on, closes when it is shut off

*Uses*: Automatic valve for use in the suction lines of dust collecting systems, or of ventilating systems. Closes automatically when machine or process being vented is turned off, and opens when it is turned on again.

*Features*: Conserves heat by preventing exhausting of warm air from a room when machine or process is not operating. A valve in each leg of a suction system — where the system handles several machines or processes — is advantageous, because units left running when others are shut down receive the benefit of increased suction.



Solenoid controlled valve for suction lines has no internal obstructions to air flow when it is open

*Description*: The Ventomatic valve is extremely simple in design, and can be fitted to any machine, pipe, or installation within its scope (duct sizes from 3 to 8"). Operation is controlled by solenoid and is in no way affected by the air stream. When open, there is no obstruction to the passage of air, so that dust build-up will not occur for that reason.

(Product of Kindt-Collins Company, Dept. CP, 12653 Elmwood Ave., Cleveland 11, Ohio . . . or for more information check CP 6273 on handy form, pages 2 and 3.)

# GUARD AGAINST EXPLOSION with R-C INERT GAS GENERATORS



Portable R-C Inert Gas Generator used for purging operations and stand-by protection in large gas-producing plant. Capacity 15,000 cfh.

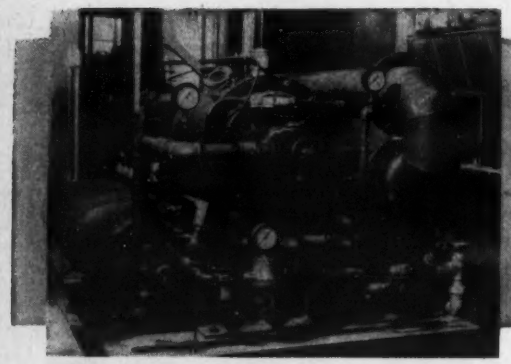
If your operations involve materials or processes which might cause an explosion-produced fire, you can reduce the risk with R-C Inert Gas Generators. In many instances, the relatively small cost is absorbed by savings in insurance costs.

These mobile or stationary units instantly produce a continuing flow of inert gas, for use in purging gas or liquid lines, blanketing dangerous areas and for many other industrial uses involving the handling or storage of explosive materials.

R-C Inert Gas Generators are compact, simple and inexpensive to operate, with either oil or gas as fuel. They are available in capacities from 1,000 cfh to 50,000 cfh, with characteristics to match specific requirements.

Where even a relatively low explosion hazard exists, one incident might produce a disastrous fire. Ask for details on how such dangers may be averted with R-C Inert Gas Generators.

ROOTS-CONNERSVILLE BLOWER CORPORATION
526 Richland Avenue, Connersville, Indiana



Installation of three R-C Inert Gas Generators similar to this one helped one large plant save $6,000 per month insurance premiums, as well as substantially reduce danger of production losses caused by explosion or fires. Capacity of each unit, 6,000 cfh.

Reg. U. S. Pat. Off.

ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

When inquiring check CP 6274 on handy form, pgs. 2-3


***Machine gives dry copy of anything printed in about 30 sec . . .***

requires no washing, drying, fixing, or darkroom

*Uses*: To make duplicate copy of anything typed, written, printed, or drawn.

*Features*: Produces dry copy of original in just about 30 seconds.

*Description*: Exact-Phote-Copy is operated from any electrical outlet. Original plus sheet of negative paper are placed in machine. In about 8 seconds, two sheets are ejected. Two sheets are separated, and negative paper plus sheet of transfer paper are inserted into machine. Copy is processed in 10 seconds: in another 10 seconds, two sheets may be separated to produce dry copy of original on positive, transfer form.

Equipment is motor driven, continuous printer and processing unit. It will also make duplex copies (copies of two-sided material). Machine eliminates need for separate printer, and requires no washing, fixing, drying, darkroom, or chemical reagents to make duplication.

(Product of General Photo Products Co., Inc., Dept. CP, General Photo Bldg., Chatham, N. J. . . . or for more information check CP 6275 on handy form, pages 2 and 3.)

***Too cold for painting? This one can dry at 35°F . . .***

line also includes enamel for use at –50°F against moisture

*Uses*: For protecting metal surfaces against corrosion caused by moisture.

*Features*: One enamel can be applied at 35°F; another is designed to withstand temperatures as low as –50°F. Both are reported by manufacturer to dry in two hours.

*Description*: Damp-Proof enamel is odorless, can be brushed on walls of refrigerated spaces, can even be applied to damp surfaces. Moisture is permitted to escape through the painted surface, afterwards forming a seal against further penetration of moisture. Another protective coating in manufacturer's line is Ice-Proof enamel which can be used in temperatures as low as –50°F and also on damp surfaces.

(Development of Koch Supplies, Dept. CP, 2520 Holmes St., Kansas City 8, Mo. . . . or for more information check CP 6276 on handy form, pages 2 and 3.)


# EVERY STEP A SAFE STEP WITH BLAW-KNOX GRATING

Everyone walks safely, confidently on Blaw-Knox Electroforged Steel Grating . . . the one-piece panels stay rigid and strong—without shimmy or shake—because there are no parts to work loose. Twisted cross bars provide sure footing under the most adverse conditions. For complete information, write for Bulletin 2365.

BLAW-KNOX GRATING
*Industry's first choice for*
• SAFETY • STRENGTH • LONG LIFE
• LOW UPKEEP • SELF-CLEANING

*Grating Department*
BLAW-KNOX DIVISION of Blaw-Knox Co.
2076 Farmers Bank Bldg.,
Pittsburgh 22, Pa.



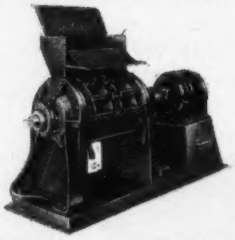
BLAW-KNOX ELECTROFORGED STEEL GRATING

When inquiring check CP 6277 on handy form, pgs. 2-3

# WHEN IT'S A QUESTION OF
## Cutting • Shredding • Grinding • Sizing . . .

Paper
Plastic Scrap
Asbestos
Tobacco
Bones
Wood Chips
Cardboard
Spices
Chicle
Licorice
Crab Shells
Leather Scrap
Drugs
Gums
Feathers
Fur
and Similar Materials

*Use the Abbé Rotary Cutter*



- Minimum "fines"
- More uniform product
- Rugged construction
- Perfect shearing action
- Low over-all operating cost
- No overheating
- No mangling
- Quick change screens for various mesh requirements
- Any needed material of construction

Also available in laboratory sizes.
For complete data, write for Bulletin 45

ABBÉ ENGINEERING CO. 46 CHURCH STREET NEW YORK 7, N. Y.
Makers of
ABBE ENGINEERING Ball, Pebble and Jar Mills

When inquiring check CP 6278 on handy form, pgs. 2-3

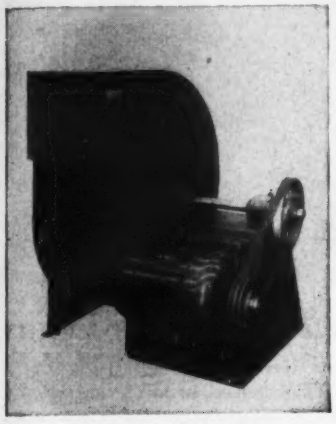
***Air, materials, or long shavings can all be handled with same fan unit . . .***

specially constructed wheels are available for extending applications over wide range

*Uses:* When respective wheels are installed, fan unit can be used for air handling, materials handling, or for long, stringy fibers such as shavings. Reported particularly suitable for exhausting smoke, fumes, and light dusts.

*Features:* One unit can be made to handle more than one type of material, merely by attaching wheel designed for the specific purpose.

*Description:* Fan is made in 11 sizes with capacities ranging from 670 to 44,000 cfm and pressures up to 16" water gage. The air handling wheel has several backwardly-inclined blades featuring low power consumption over a wide range of volumes and pressures. The heavy-duty, straight-bladed, side-plated materials handling wheel is designed for sawdust, granular materials, and chips. The long shavings wheel has no side plates and is meant to handle long, stringy fibers.



Applications are widespread

Standard accessories for the fan include both bolted and quick-opening type access doors, flanged outlets and inlets, and outlet dampers. It is available with a variety of special coatings, and can also be built of special metals to meet explosion-proof or anti-corrosive specifications.

For high temperature applications, special cooling accessories are available.

(Development of Westinghouse Sturtevant Division, Dept. CP, 200 Readville St., Hyde Park, Boston 36, Mass. . . . or for more information check CP 6279 on handy form, pages 2 and 3.)

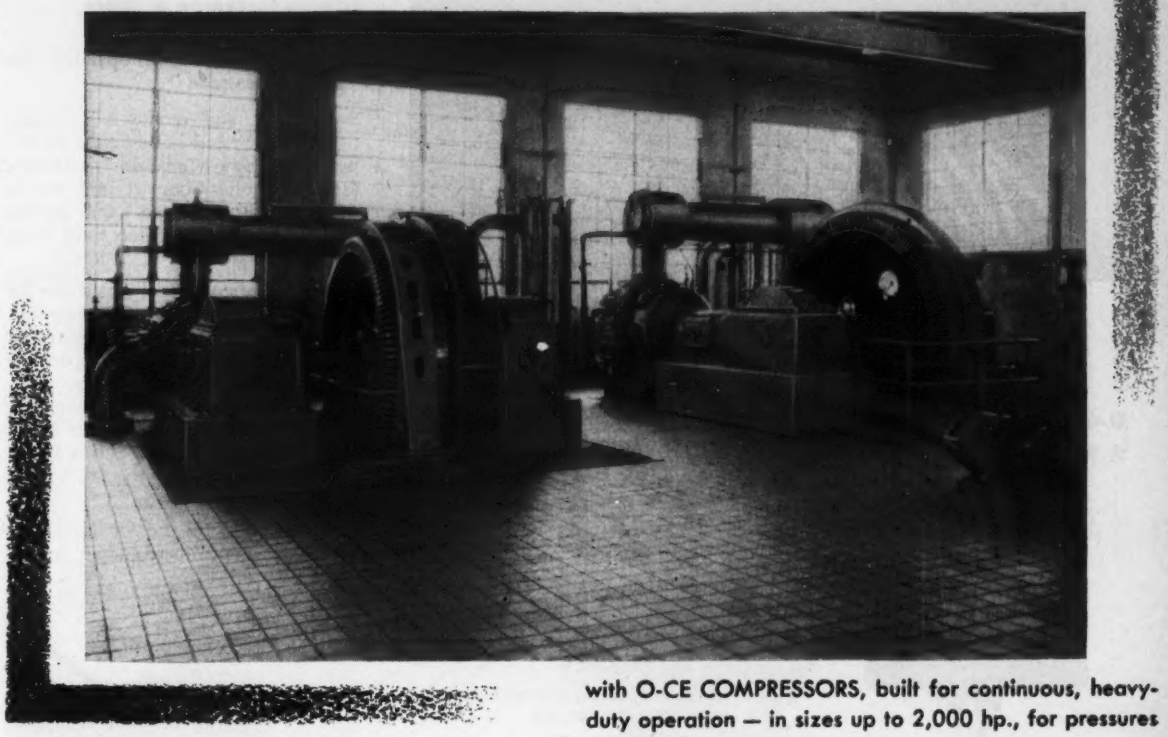
***Prevents dust accumulation with reverse air action***

Eight-page bulletin announces unique dust filter for use in continuous process industries where uniform suction at all dust points is essential. Unit utilizes reverse blasts of air to remove dust which tends to accumulate on filter bags and decrease efficiency.

Complete engineering data, including details of construction, principle, and applications, are presented. Numerous line drawings and annotated photographs illustrate typical installations and features of design.

Schematic drawings explain principle of operation in detail. Handy tables summarize data on various specifications. Hints on engineering of dust control problems are included.

Bul No. 102 is issued by The W. W. Sly Manufacturing Co., Dept. CP, Cleveland 2, Ohio. When inquiring specify CP 6280 on handy form, pages 2 and 3.

meet AIR DEMANDS economically

with O-CE COMPRESSORS, built for continuous, heavy-duty operation — in sizes up to 2,000 hp., for pressures to 5,000 lbs.

Of horizontal, double-acting, water-cooled type, with direct-mounted synchronous motor drive, these compressors are unsurpassed for dependable, low-cost performance.

- ✓ Equipped with roller bearings throughout.
- ✓ Quick-acting Simplate valves minimize power consumption.
- ✓ Large, stream-lined air passages make air flow resistance negligible.
- ✓ CP Multi-Step Control handles partial load demands economically.
- ✓ CP Automatic Starting Unloader completely unloads compressor when starting and stopping, and permits automatic restarting after power failure.
- ✓ CP Intercooler assures maximum heat transfer with low water consumption.

Write for full information.

CP Fiftieth ANNIVERSARY

CHICAGO PNEUMATIC TOOL COMPANY

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

When inquiring check CP 6281 on handy form, pgs. 2-3

FOR BETTER VALVE AND UNION PERFORMANCE:

# FAIRBANKS

## All Star Team

An unbeatable combination — the "first string" team of valve and union for dependable trouble-free piping installations.

***Look at the lineup:***

**U-01 BRONZE GLOBE VALVE**

★ Renewable Composition Disc

Perfect sealing at all times—

A disc for every type of service—

#50—a hard disc for general usage

#52—a rubber disc for cold water valves

#60—a special synthetic disc highly resistant to gasoline, oils and many acids and alkalies.

★ Two Piece Union Bonnet
—Quick, easy disassembly
—No sliding or scraping between body and bonnet—NO WEAR

★ Radial Seat of Two Piece Union Bonnet
—Leak-proof Body Bonnet Joint
—Rigid alignment of all parts—guaranteed perfect seating all the time.




**DART UNION**

★ Ground Ball Joint having extra wide seating surfaces

★ Two Bronze Seats, non-corroding, on both sides of the seat

★ Leak-proof without excessive torque because of true bearing surfaces

★ High-test air-refined malleable iron body will not stretch, practically unbreakable.

THE **Fairbanks** COMPANY

393 LAFAYETTE STREET · NEW YORK 3, N. Y.

Branches:

New York 3 • Pittsburgh 25 • Boston 10 • Rome, Ga.

**VALVES • DART & PIC UNIONS • TRUCKS • CASTERS**

When inquiring check CP 6282 on handy form, pgs. 2-3



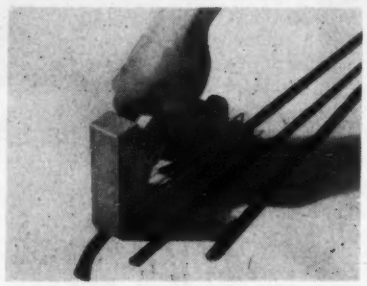
***Speeds fastening of cable and tube lines . . .***

compact machine is operated with just one hand

Swift, easy, and economical installation of cables and hollow tube lines is provided by hand-held, automatic fastening gun. Compact unit can be operated with just one hand, leaving other hand free to guide lines being installed.

In spite of being small, machine has power of a big industrial stapler. Its unusual force will drive bands around cables and tubes into hard or soft woods, plaster walls, flooring, joists, mortar joints, and cinder or mineralite building blocks. Fastening gun drives special extra-size band which is available in leg lengths varying from 3/16 to ½ inch.

Fastener is now in use for installation of coaxial cable lines, copper tubing,



Fastener is operated with one hand while driving bands around tubes

thermostatic controls, gas refrigeration and incinerator units, chemical flow controls, transformer separators, and many types of heavy wiring.

(Product of The Heller Company, Dept. CP, 2153-E Superior Ave., Cleveland 14, Ohio . . . or for more information check CP 6283 on handy form, pages 2 and 3.)

***Standard for coating thickness outlined***

Four-page reprint discusses development and use of methods for evaluating relationship between depth of surface profile of grit- or sand-blasted metal surfaces and required film thickness for protective coating system.

Study of profile, evaluation of completed coating system, and testing by electrographic printing are described. Charts and photographs illustrate test panels and recordings of profile.

To obtain "New Standard for Coating Thickness" remit 10 cents direct to Office of Information Services, New York University College of Engineering, New York 53, N. Y.

**CHAMBERS *Special-Purpose* EXTRUDERS**

**Built to Your Requirements**

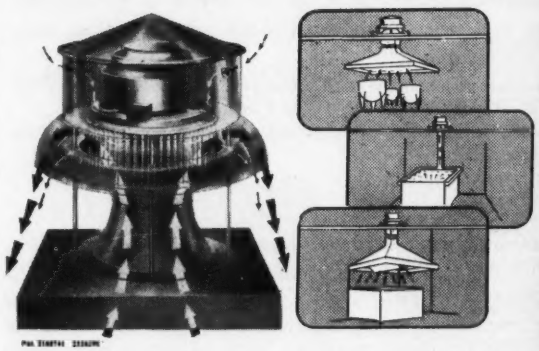



**CHAMBERS BROTHERS COMPANY**

52nd & Media Sts. PHILADELPHIA 31, PA.

When inquiring check CP 6284 on handy form, pgs. 2-3

**IT PAYS to know these Facts about Exhausting Moisture and Fumes**



**CERTIFIED RATINGS:** Gallaher Air Vans are tested by an independent laboratory — a test of the whole unit *not* just the fan wheel. You can be sure of Gallaher performance data — it's tested *not* interpolated.

**SAFE MOISTURE AND FUME REMOVAL** — Motor out of the air steam with the exclusive patented air seal off to make it certain. How safe? Gallaher units are safely used for ether and air concentrations *without* explosion proof motors.

**EFFICIENT:** SCROLL EFFECT designed into the unit and exclusive with Gallaher. Research tests show that efficiency against *even normal* static pressures is not possible without it.

**STRONG:** We invite comparison with any comparable unit. Our specifications are *published* and available by asking your local Gallaher representative or writing Dept. A, 4108 Dodge Street, Omaha, Nebr.

**Capacities 150-11,000 CFM; Static pressures to 1¾"**

**The GALLAHER Company**

Omaha, Nebr. Owatonna, Minn.

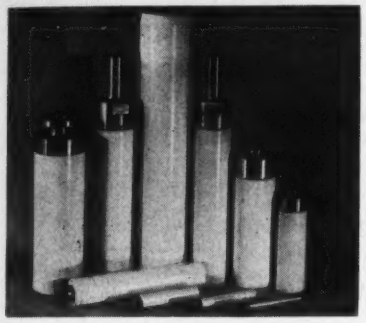
When inquiring check CP 6285 on handy form, pgs. 2-3

***Abrasive or corrosive fluids not harmful to ceramic pump plungers . . .***

high-strength alumina-base material has been tested successfully in chemical plants, oil fields

*Uses*: Now being used in the chemical industries for proportioning pumps and corrosive and abrasive pumping work. In the oil fields, ceramic pump plungers are being used for pumping cement, mud, salt water, and other abrasives at high pressures.

*Features*: Long, dependable service under high pressure, and corrosive or abrasive conditions. Plungers made in limited quantities and for special applications have been successfully operated in oil fields and chemical plants for the past three years. A variety of designs, in sizes ranging from 7/16" up to 5" diameter, have been produced for several pump manufacturers.



Ceramic pump plungers equipped with adapters

*Description*: Basic design of the Coors High-Strength Ceramic Pump Plunger is a solid piece of alumina ceramic bar stock which is ground on the outside diameter to very close dimensional tolerances with highly polished surfaces. Usually one end has a reduced diameter to fit into a steel adapter which connects the plunger to the operating mechanism.

(Details on application of Coors High-Strength ceramic for pump plungers may be obtained from Landes, Zachary and Peterson, 2500 W. Seventh Ave., Denver, Colo., sales representatives for Coors Porcelain Company . . . . or for more information check CP 6286 on handy form, pages 2 and 3.)

***Rubber-base paint aids fight to protect concrete floors from wear and tear . . .***

will not react with caustic soaps, saponify, or rub off because of alkalis in concrete

Manufacturer's floor enamel is intended to protect commercial and industrial concrete floors from traffic wear, moisture, and attack by chemicals or cleaning compounds.

It is synthetic rubber-resin base coating (not water latex emulsion) and is durable when applied to old or new masonry floors. Coating may also be applied to uncured concrete, basement floors, and to floors laid directly on ground over cinder fill.

Floorkote dries to rich gloss in four hours. It seals the floor and will not react with caustic soaps or cleaning compounds. It will not saponify or rub off because of alkalis present in concrete and is reported to retain luster under severe maintenance conditions.

(Product of The Tropical Paint & Oil Company, Dept. CP, Cleveland 2, Ohio . . . or for more information check CP 6287 on handy form, pages 2 and 3.)





...Greatest Improvement in Tank Heating in 30 Years

Brown Fintube Thermo-Flo Tank Heaters are more efficient, and usually *cost less plus their installation,* than the cost of just installing equivalent capacity of old fashioned bare pipe coil in the bottom of the tank.

Brown Thermo-Flo heaters mount vertically, on adjustable legs about 12" above the tank bottom, thus preventing depositing on the tubes; and avoiding the lost efficiency of heating the tank bottom, and a layer of sediment. The bottom of the tank is uncluttered and easy to clean. The entire surface of the fintubes is exposed to the tank contents. Material adjacent to the fintubes is heated quickly and rises rapidly, forming a thermal syphon or flow past the fintubes; keeping the heating surfaces clean; assuring extremely efficient heating; and preventing any stratification of temperature or gravity in the tank.

TYPICAL INSTALLATIONS IN MAJOR REFINERIES

Purchased on the Basis of Proven Advantages

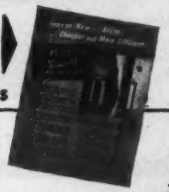
| | |
|---|---|
| Tank Farm No. 1 | 81 Heaters |
| Tank Farm No. 2 | 114 Heaters |
| Tank Farm No. 3 | 76 Heaters |
| Tank Farm No. 4 | 110 Heaters |
| Tank Farm No. 5 | 51 Heaters |
| Tank Farm No. 6 | 42 Heaters |
| Tank Farm No. 7 | 294 Heaters |
| Tank Farm No. 8 | 74 Heaters |

Above heaters being used to heat viscous crude oils, lubricating oils, tar, asphalt, etc.

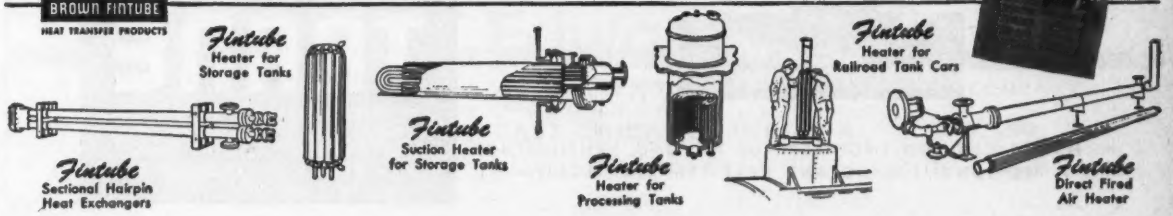
BROWN FINTUBE CO.

HOME OFFICE and WORKS • ELYRIA, OHIO

Send for Bul. No. 491 IT WILL GIVE YOU IDEAS



HEAT EXCHANGE SURFACE BROWN FINTUBE HEAT TRANSFER PRODUCTS




When inquiring check CP 6288 on handy form, pgs. 2-3

# Now... closer temperature approaches in heat exchange




## WITH TRANE BRAZED ALUMINUM SURFACE

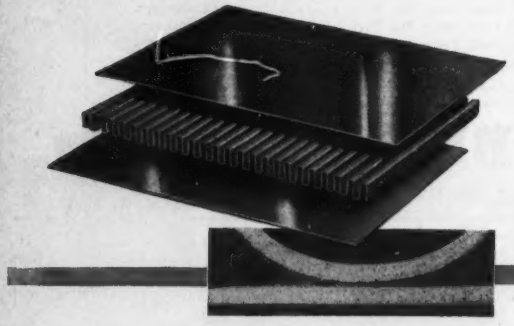
**Now . . . even with a large temperature change or drop . . . you can obtain *temperature approaches of 5° to 10° F.***

**TRANE Brazed Aluminum heat exchange surface makes it not only possible—but *practical!* That's because the new TRANE Brazed Aluminum packs up to 450 square feet of surface into a single cubic foot of space.**

**This huge amount of surface in a single unit makes maximum use of available pressure drop. And you don't lose pressure through connections.**

**TRANE Brazed Aluminum can handle heat transfer between three, four, five or more streams simultaneously —liquid to liquid, liquid to gas, or gas to gas. Temperatures from 500° F. to –300° F. Tested at pressures up to 1000 Psig.**

***Want more information? Contact your nearest TRANE sales office, or write The TRANE Company, LaCrosse, Wis.***



**WHAT IS BRAZED ALUMINUM?** A stack of flat plates and corrugated fins in layers, all brazed in perfect bond. Strong, light, compact and completely flexible. Illustration below shows strong fillet formed between fin and plate.

MANUFACTURING ENGINEERS OF HEATING, VENTILATING, AIR CONDITIONING AND HEAT TRANSFER EQUIPMENT

TRANE

THE TRANE COMPANY, LA CROSSE, WIS.
Eastern Mfg. Division, Scranton, Pa.
Trane Company of Canada, Ltd. . . . Toronto
Offices in 80 U.S. and 14 Canadian Cities

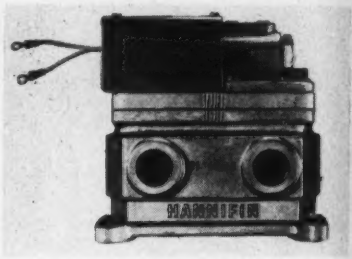



***Springs or levers not required in 4-way pressure operated valve . . .***

unit, which is two valves in common body, normally has one valve open and other closed

Neither springs nor levers are required in unique design of manufacturer's 4-way valve since it is operated by the pressure introduced to chamber. Unit, which is simply two valves in one compact common body, has internal coring so arranged so that one valve normally operates open while other is normally closed.

Series BB 4-way valve, recently introduced to manufacturer's P-M line of Pilot-Master valves, contains two Series B 3-way valves. Two valves shift simultaneously when pressure enters chamber over the two piston-poppets. Pressure within unit returns both valves to their normal position when pilot pressure is released.




One size pilot head fits all three sizes of 4-way valve

Main portion of valve comes in three different sizes, ⅜, ½, and ¾ inches. Two piston-poppet assemblies, only moving parts of main portion of valve, are identical for all three sizes. Both assemblies fit in removable, replaceable cartridges, identical with cartridges used in like sizes of 2-way and 3-way Pilot-Master valves. In addition, one size of pilot head fits all three sizes. This enables stock of replacement parts to be reduced to minimum.

Series BB-2 pilot head employs same quality solenoid used with Series B-2 head for 2-way and 3-way valves and uses same lightly stressed steel return spring. Action is equally fast, speeds to 600 cycles per minute being practical with combination. For momentary contact operation, Series BB-4 pilot head can be supplied with two solenoids.

(Introduced by Hannifin Corp., Dept. CP, 1150 S. Kilbourn Ave., Chicago 24, Ill. . . . or for more information check CP 6289 on handy form, pages 2 and 3.)

***Resilience is provided in bearings with free floating nylon liner in thin steel sleeve . . .***

will resist poundout, lessen friction, permit dry operation, damp vibration, and minimize abrasion failures

*Uses*: For miscellaneous bearing applications. Units are suitable for uses requiring close fits or submerged operation. Bearings can be used with or without lubrication as required.

*Features*: Bearings of resilient material are supplied in units consisting of thin, drawn steel outer sleeve and free floating liner of DuPont FM 10001 Nylon. Units offer a solution to bearing problems by their resistance to poundout, lower friction, allowance of dry operation, absorption of mechanical vibration, and by minimizing abrasion failures.

*Description*: Standard Thinwall Nylined Bearings are corrosion resistant, compact, and lightweight. Units have long life and require low maintenance in most applications.

Nylon liner, which is an instantly replaceable bearing surface, is provided with a spiral compensation gap. This gap compensates for dimensional changes in circumference due to expansion and contraction which would otherwise cause fluctuations in bore diameter. In applications where lubrication is required, gap also serves to distribute lubricant in an axial direction. This occurs since gap connects with center circumferential lubrication slot which receives lubricant through hole in outer sleeve.



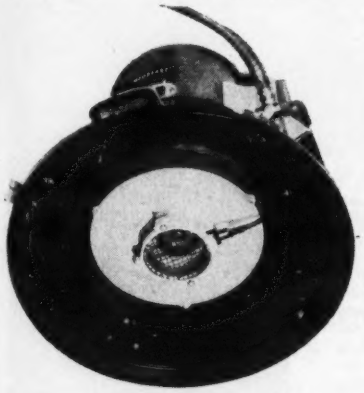
Sectional view of bearing shows nylon liner in thin steel shell

Bearings are initially being offered in ten sizes ranging from ¼ to 1¼ inches ID.

(Developed by Thomson Industries, Inc., Dept. CP, Manhasset, N. Y. . . . or for more information check CP 6290 on handy form, pages 2 and 3.)

### *Motor flooding and overloading of vacuum cleaners prevented by electronic shutoff*

Electronic motor shutoff fully protects industrial vacuum cleaner motors against flooding troubles and overloading. Flooded electric motors have long been a costly source of trouble to users of industrial vacuum cleaners because of overloaded vacuum tanks. Result is that water or other liquids are drawn up into motor turbines and bearings, leading to costly repairs and loss of time.



If one drop of water crosses electrodes, vacuum cleaner motor will be shut off

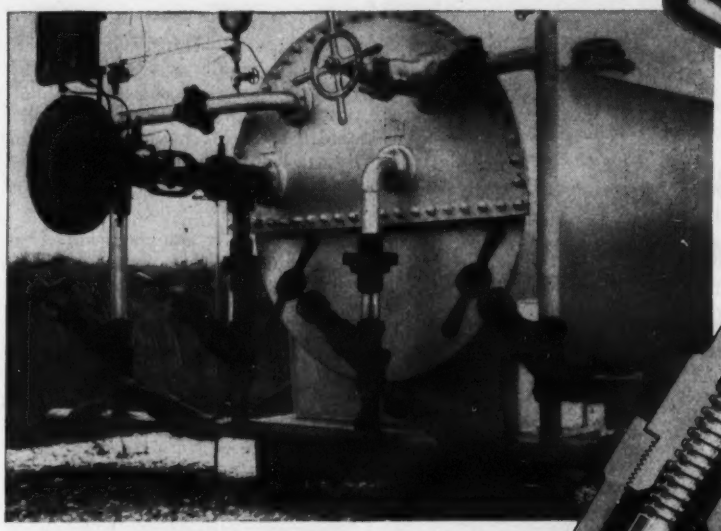
These troubles are resolved by electronic shutoff. Device is an independent wiring system which includes two electrodes mounted parallel at base of turbine. As little as one drop of water crossing these electrodes will cause them to break circuit, shutting off motor. Motor cannot be started again until electrodes have been dried, vacuum tank emptied, filter drained, and motor switch turned off and back on.

Several models of Multi-Clean industrial vacuum cleaners are offered with electronic shutoff as standard equipment.

(Product of Multi-Clean Products, Inc., Department CP, 2277 Ford Parkway, St. Paul 1, Minnesota . . . or for more information check CP 6291 on handy form, pages 2 and 3.)


# For Punishing Pressures

## Edward 6000 lb W. P. FORGED STEEL VALVES



Rugged 2″ figure 158 valves in outdoor application in natural gas industry. Impactor handle, furnished with 2″ size, gives 2.8 times closing force of ordinary handles.

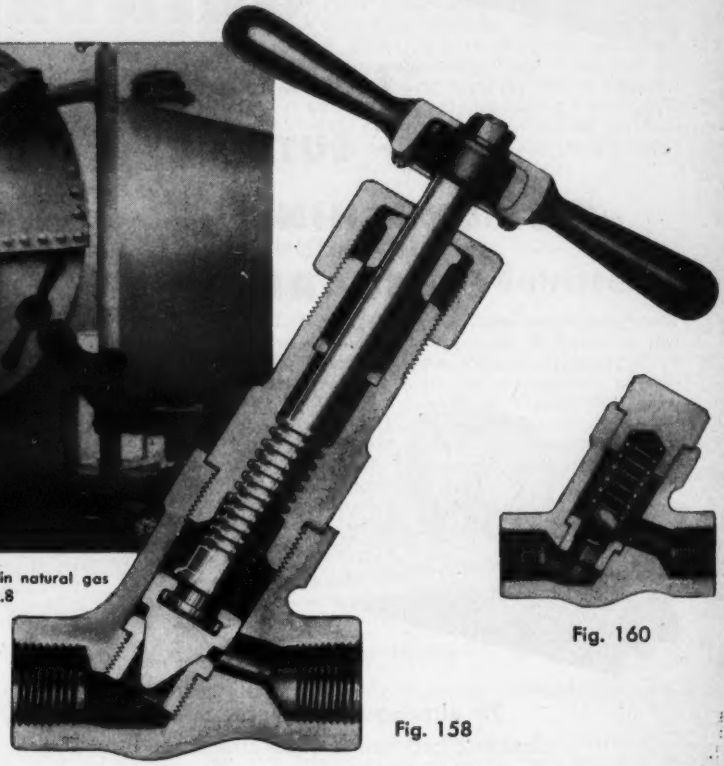


Fig. 158



Fig. 160

**Rated for 7500 lbs at 125F in the 2″ size and for 6000 lbs at 125F in the ¼″ to 1½″ sizes, Edward drop forged steel Fig. 158 stop valves have been developed for excessive pressure systems operating under 300F. These design details insure certain shut off, reduce replacement costs and maintenance time:**

- ✓ Drop forged steel bodies specially heat treated.
- ✓ Stem at 60 degree angle to reduce wear producing turbulence, lower pressure drop.
- ✓ Seat, disk, and stem of EValloy 13% chromium stainless steel.
- ✓ Renewable screwed in seat with long threads below pressure joint for leak proof seating.
- ✓ Inside screw construction, deep stuffing box and special gland and packing nut design to lengthen packing life.
- ✓ Bonnets EValized by exclusive plating process for maximum corrosion and abrasion resistance.
- ✓ Body contours streamlined for free flow with low pressure drop.
- ✓ Stem of EValloy stainless steel, centerless ground to fine finish, long wearing Acme form threads, backseating shoulder.

Furnished in globe and angle designs with screwed or socket welding ends in sizes from ¼″ to 2″. Also available as ball check valves, Fig. 160, in same ratings and sizes. Ball check valves have identical body and seat, rolled steel bonnets, stainless steel ball accurately ground for tight seating, and stainless steel spring to aid in seating ball in more viscous fluids.

For complete catalog of forged and cast steel valves write Dept. OG, Edward Valves Inc. 1230 West 144th St. East Chicago, Indiana

**Edward Valves, Inc.**

Subsidiary of ROCKWELL MANUFACTURING COMPANY

EAST CHICAGO, INDIANA

Another Product


When inquiring check CP 6292 on handy form, pgs. 2-3

here is a

VERSATILE*

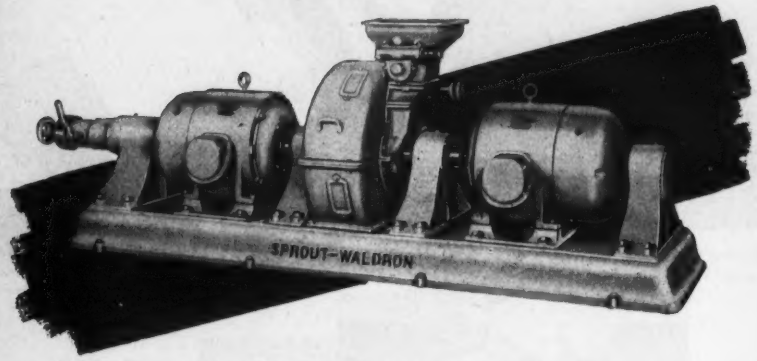
GRINDER

*for RUBBING

*for CUTTING

*for CRUSHING

*for TEARING




By altering disc surfaces, speed of rotation, clearance between surfaces and method of feeding, the Sprout-Waldron Attrition Mill performs the widest variety of size reduction operations. It grinds rubber or grain, tears and rubs wood chips, curls feathers, de-fiberizes leather, granulates plastics — just to mention a few of its countless applications.

If you have a size reduction problem, Sprout-Waldron is uniquely well-equipped to help you. Why not take advantage of our experience based on hundreds of successful installations in the chemical processing and allied fields? Write for full details to Sprout-Waldron & Co., Inc., 10 Logan Street, Muncy, Pennsylvania.

SW

SPROUT-WALDRON

The Best in PROCESSING EQUIPMENT Since 1866

MUNCY, PA.

250

When inquiring check CP 6293 on handy form, pgs. 2-3

## CONSTRUCTION

***Rack for records allows a quick recourse into past . . .***

24" pathway is all that is needed for journey through the years

*Uses*: For storing of old records.

*Features*: Utilizes upper waste space: saves on floor area since racks require only 24" aisles.

*Description*: Having no drawers, steel storage files were designed for compact storing of old records. Records can go directly from current files onto shelves in chronological, alphabetical, or numerical order. Label holders permit instant location for quick reference.

Units which are equipped with front bases and finished in olive green baked-on enamel are 3' wide, 7 or



Old records are stored compactly

10' high, with large choice of depths. Shelves adjust vertically on 1½" centers to accommodate various size files. Any unit may be removed without moving adjacent units. This set-up allows greater flexibility in adjusting for requirements.

(Development of Equipto, Div. Aurora Equipment Co., Dept. CP, Aurora, Ill. . . . or for more information check CP 6294 on handy form, pages 2 and 3.)

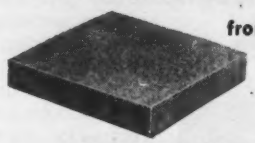
***Free air flow permitted by design of roof ventilator . . .***

especially effective in clearing fumes and heat

Counterweights or other obstructions do not hinder free flow of air in automatic fan-powered roof ventilator, called the "Airjet." Unit is especially effective in clearing fumes and heat from above furnaces, found-

*Armstrong's*

VIBRACORK CUSHIONS VIBRATION



from Hydraulic Presses, Pumps, Compressors, and many other types of Machinery and Equipment

. . . ACTUALLY FLOATS THE LOAD ON MILLIONS OF AIR CELLS!

Vibracork is a resilient machinery isolation cork plate made of pure cork granules, compressed and baked under pressure.

**Convenient to stock** — Standard sheets, 12" x 36"; Standard density 2" and 3" thick; Heavy density, 1", 2" and 3" thick.

**Easy to use** — Can be cut to size on the job with an ordinary hand saw.

**Loading range** — Standard density, 1500# to 4000# per. sq. ft.; Heavy density, 5700# to 8500# per. sq. ft.

**Availability** — Immediate delivery. Korfund is sole distributor for the United States.

For installation data and further information, ask for Bulletin VC-500.

THE KORFUND CO., INC.

KORFUND VIBRATION CONTROL — SPRINGS — RUBBER — CORK

48-13E. Thirty Second Place • Long Island City 1, N. Y.

See us at the Plant Maintenance Show Cleveland. January 19-22. Booth #618

When inquiring check CP 6295 on handy form, pgs. 2-3

LEE

Corrosion-Resistant

HEAVY DUTY

Kettles



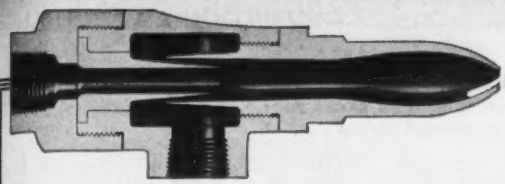
Lee Kettles are available in standard and special designs in capacities up to 500 gallons. They are easy to clean and keep clean, meet all sanitary regulations and are built to conform with the A.S.M.E. Code. Hydraulic operating cylinders are available with all tilting kettles and tilting agitators for safe pouring and cleaning.

May we send you our descriptive technical bulletins?

LEE Metal Products Company, Inc.

418 PINE ST. PHILIPSBURG, PA.

When inquiring check CP 6296 on handy form, pgs. 2-3



COMPLETE COMBUSTION
of HEAVY FUEL OILS and TARS
With
TYPE "SA" OIL BURNER

The popular NATIONAL AIROIL Steam Atomizing Oil Burner *thoroughly atomizes and completely burns* the lowest and cheapest grades of fuel oil or tar . . . requires minimum supervision and maintenance. Only slight oil pressure and temperature is needed . . . and internal atomizing venturi feature assures low steam consumption.

NATIONAL AIROIL Type "SA" Oil Burner is equally adaptable to all types of industrial heating, power or process furnaces . . . is suitable for firing above stoker grates on conversion to oil.

Write, on your business letterhead, for Bulletin 21

NATIONAL AIROIL has a complete line of Oil and Gas Burners and Furnace Equipment to meet your every requirement.

NATIONAL AIROIL BURNER COMPANY, INC.
1300 E. SEDGLEY AVE., PHILADELPHIA 34, Pa.
Southwestern Division: 2512 So. Blvd., Houston 6, Tex.

When inquiring check CP 6297 on handy form, pgs. 2-3

RM RESISTANT MATERIALS
SPECIALISTS IN ALL
RESISTANT PIPING MATERIALS
TO YOUR SPECIFICATIONS

PIPE • VALVES
FITTINGS • FASTENINGS
STAINLESS • ALUMINUM • SARAN
HARD RUBBER • POLYETHYLENE
TYGON • USCOLITE • EVERDUR
FULL RANGE OF SIZES
Complete Stocks—Prompt Shipment
(Reference No. CP 1152)

RAY MILLER
254 NORTH 10th STREET, NEWARK 7, N. J.
4240 KANAWHA T'PK., SO. CHARLESTON, W. VA.
1210 HAYS STREET, HOUSTON, TEXAS

When inquiring check CP 6298 on handy form, pgs. 2-3


ry pouring floors, vats, and other industrial equipment.

In outward appearance, ventilator is simply a box built of galvanized copper-bearing steel. Two hinged aluminum panels (which are actually louvers) form a weather-tight peak roof. They open automatically when fan is started and close when it stops. When panels are open, air-stream effectively prevents entry of rain or snow.

(Vibrator is announced by Hartzell Propeller Fan Co., Dept. CP, Piqua, Ohio. . . . or for more information check CP 6299 on handy form, pages 2 and 3.)

### *Purifies water at rate of 2400 gph . . .*

portable Army unit operates in temp as low as –40°F

US Army has developed a truck-mounted electrical water purification unit which is capable of treating, clarifying, filtering, purifying, and distributing 2400 gph of water. Unit, which was recently demonstrated at Richmond, Va., will operate satisfactorily in temp as low as minus forty degrees Fahrenheit.

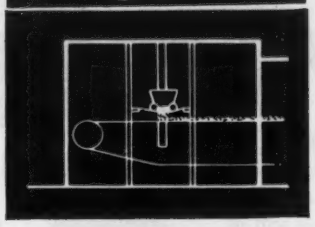
Polluted water can be pumped into unit, physically and chemically treated, and discharged as drinkable water in approx 20 minutes. Only one man is required to operate apparatus and it can be put into operation by three men in less than 90 minutes upon arrival at a selected site. Since equipment has its own power source, it can be operated in total blackout. Only audible noise is from engine driving generator.

Heart of unit is an ultra-high rate solids contact water conditioner called an erdlator. This device is connected in series with diatomite filters, the combination removing silt and destroying bacteria. Positive physical barriers are provided to passage of organisms which cause dysentery and schistomiasis, the latter being a serious water borne disease found in the Far East.

Machine can be easily transported on a cargo-type plane to combat zones. Virginia State Department of Health cooperated with the US Army Research and Development Laboratories in conducting engineering tests. Recent demonstration was last lap of a five-site test program.

(Information received from Technical Information Office, Engineer Research & Development Laboratories, U. S. Army, Fort Belvoir, Va.)









PROCTOR & SCHWARTZ
·INC·
633 TABOR ROAD
Philadelphia 20, Pa.



PROBLEM:
To increase the production of sulfa drugs to meet the market demands—yet control the quality of finished product.

SOLUTION:
A Proctor continuous conveyor system with a rolling extruder equipped with a special grid type plate was recommended by Proctor engineers. Preforming permits air to circulate through the bed of material on the constantly moving conveyor. Accurate control was maintained, production was increased and the product met all the tests for quality.

*Another processing problem solved by*
PROCTOR
INTEGRATED ENGINEERING

This processing problem was solved only by painstaking research. Exhaustive test work done in the Proctor laboratory, in cooperation with the customer's technicians, netted conclusive results that were projected into full scale operation. So accurate was this work that the performance of the drying system was guaranteed in the sales contract and the dryer was designed to dovetail right into the complete processing line. This approach to a processing problem is INTEGRATED ENGINEERING AT WORK!

*By INTEGRATED ENGINEERING we mean simply this—*

1. Sales engineers are available for consultation.
2. A completely equipped experimental laboratory is available for test work at no cost or obligation.
3. Engineering background and experience in drying equipment and its relation to associated processing equipment in the range.
4. Close cooperation between Proctor engineers and the customer's technicians to bring about the solution to processing problems.

*NOW PROCTOR IS PREPARED TO ENGINEER AND MANUFACTURE RELATED EQUIPMENT*

With their long background in designing and building precision drying machinery, Proctor engineers have acquired a wide knowledge of processing equipment requirements . . . so that today Proctor & Schwartz actually offers a complete engineering-manufacturing facility ready to help you consider not only your drying equipment needs—but a complete range of related processing equipment.

What is your processing machinery problem? Let Proctor INTEGRATED ENGINEERING help speed your solution.

When inquiring check CP 6300 on handy form, pgs. 2-3

# most any product in most any industry can be made better with DOWICIDE "A"

Dowicide® A is water soluble and is, therefore, easily added to water extended adhesive solutions giving them protection from decomposition caused by mold and bacterial attacks.

Dowicide A is used effectively to disinfect contaminated walls before the application of a mold resistant paint. Water extensible paints are preserved with Dowicide A.

Dowicide A is used to disinfect buildings, egg storage rooms, and poultry feeding stations. When used in the wax emulsion coating, it protects citrus fruits from blue mold and stem-end rot.

In the paper industry, Dowicide A is used to protect paper sizing and coating solutions from mold and bacterial attack, both during use and storage.

Dowicide A protects soluble oil emulsions from bacterial decomposition and the accompanying unpleasant odors, emulsion breakdown, and the clogging of screens.

Rayon or silk thread in storage is protected against mildew by the addition of Dowicide A. It is also used to preserve protein, animal glue, casein and starch sizing solutions.

Water solutions of Dowicide A are used as disinfectants and germicides in public buildings and homes, and as a deodorant in and around garbage cans and chemical toilets.

Dowicide A prevents mold and bacterial growth during many stages of leather processing. It is also used to protect coating and finishing materials from costly bacterial attacks.

MAKE your own tests today! We believe you will find even more new uses for Dowicide A. If you are confronted with a specific problem, make use of Dow's complete laboratory facilities—write for information concerning the many different Dowicide products, including Dow's PENTA, the dependable wood preservative.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

The Dow Chemical Company
Dowicide Department DC-36, Midland, Michigan
Please send me the Dowicide Product Information File.

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I am interested in using Dowicide Products for_____

DOW CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE

When inquiring check 6301 on handy form, pgs. 2-3



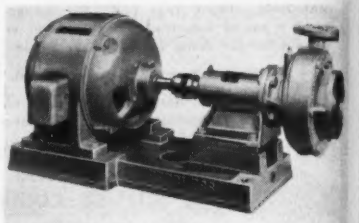

### *Prevention of leaks is assured by mechanical shaft seal of chemical pump . . .*

semi-open impeller with repelling vanes on back facilitates handling of suspended solids

*Uses*: Pump is satisfactory for continuous or intermittent light duty in transferring process chemicals, including acids, bases, salts, and solutions in varying concentrations. Practically all requirements of low temperature and low pressure chemical transfer service can be met with pump.

*Features*: Prevention of leaks along pump shaft is virtually assured by use of mechanical shaft seal in place of usual stuffing box. Mechanical seal reduces shaft overhang, bearing loads, and shaft run-out at seal.

Another design feature is use of semi-open type impeller with repelling vanes cast on back of impeller shroud. Repelling vanes assure pump having maximum slurry and abrasive handling capabilities.



Chemical transfer pump designed for handling corrosive and abrasive liquids at moderate temperatures and pressures

They further provide a pumping action which prevents accumulation of solids between impeller and casing side walls by agitating solids into center of stream flow. No wear rings are necessary. Reduction of pressure on shaft seal, providing optimum seal performance, is also obtained by this impeller design.

*Description*: Characteristics of Type CTB pump include horizontal end-suction, top discharge design, with vertically split case. Built in four sizes, capacity range is from 10 to 140 gpm, heads range from 10 to 140 feet, and hp ranges from 1 to 10. Temperature of liquids handled can be up to 250°F. Materials of construction include cast iron frame and wetted end of No. 20 stainless steel, which makes it suitable for handling corrosive liquids. This type alloy has chrome-nickel content of approx 50%.

(Introduced by Peerless Pump Div., Food Machinery and Chemical Corp., Dept. CP, 301 West Ave. 26, Los Angeles 31, Calif. . . . or for more information check CP 6302 on handy form, pages 2 and 3.)

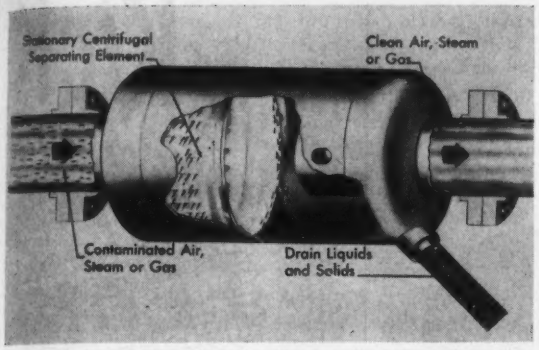
### *Automatically removes 99 per cent of all moisture, dirt, and guck from steam and vapor lines . . .*

device uses stationary centrifugal to separate impurities

*Uses*: To remove moisture, dirt, oil, and other impurities from air, gas and vapor lines. This is intended to protect equipment such as steam ejectors, valves, turbines, reciprocating engines, and similar pipeline equipment.

*Features*: Purifier removes over 99% of the impurities, even at extreme velocities and pressures. Unit operates automatically, without any moving parts or baffle plates.

*Description*: Entrainment laden vapor enters Hi-Ef Purifier and is engaged by stationary centrifugal separating element, which imparts a controlled but rapid rotational




**Operating fundamentals of purifier is indicated in cutaway**

motion to vapor. This action throws all solids and water outward to walls of purifier. From here it is ejected out the drain. Entire action occurs without appreciable drop in pressure; and the greater the velocity through the unit, the better the separating efficiency.

Purifier is made in all standard sizes up to 24" for pressures up to 600 psig. Except for low pressure types, all units are designed, built, and stamped to ASME code for unfired pressure vessels. Purifiers have forged steel flanges with borders of welded steel construction. They are compact and easily installed under ordinary conditions.

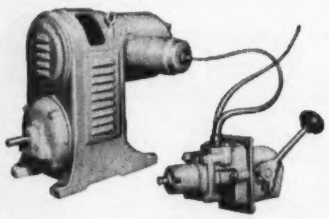
(Product of V. D. Anderson Company, Dept. CP, 1935 W. 96th St., Cleveland 2, Ohio . . . or for more information check CP 6303 on handy form, pages 2 and 3.)

***Pneumatic remote control regulates variable speed motors . . .***

speed of motor can be controlled from several stations or one station can control several motors

*Uses*: As remote control to adjust speed of manufacturer's motors. Pneumatic control may be used to provide speed changes from one pre-set finite speed to another by one quick movement.

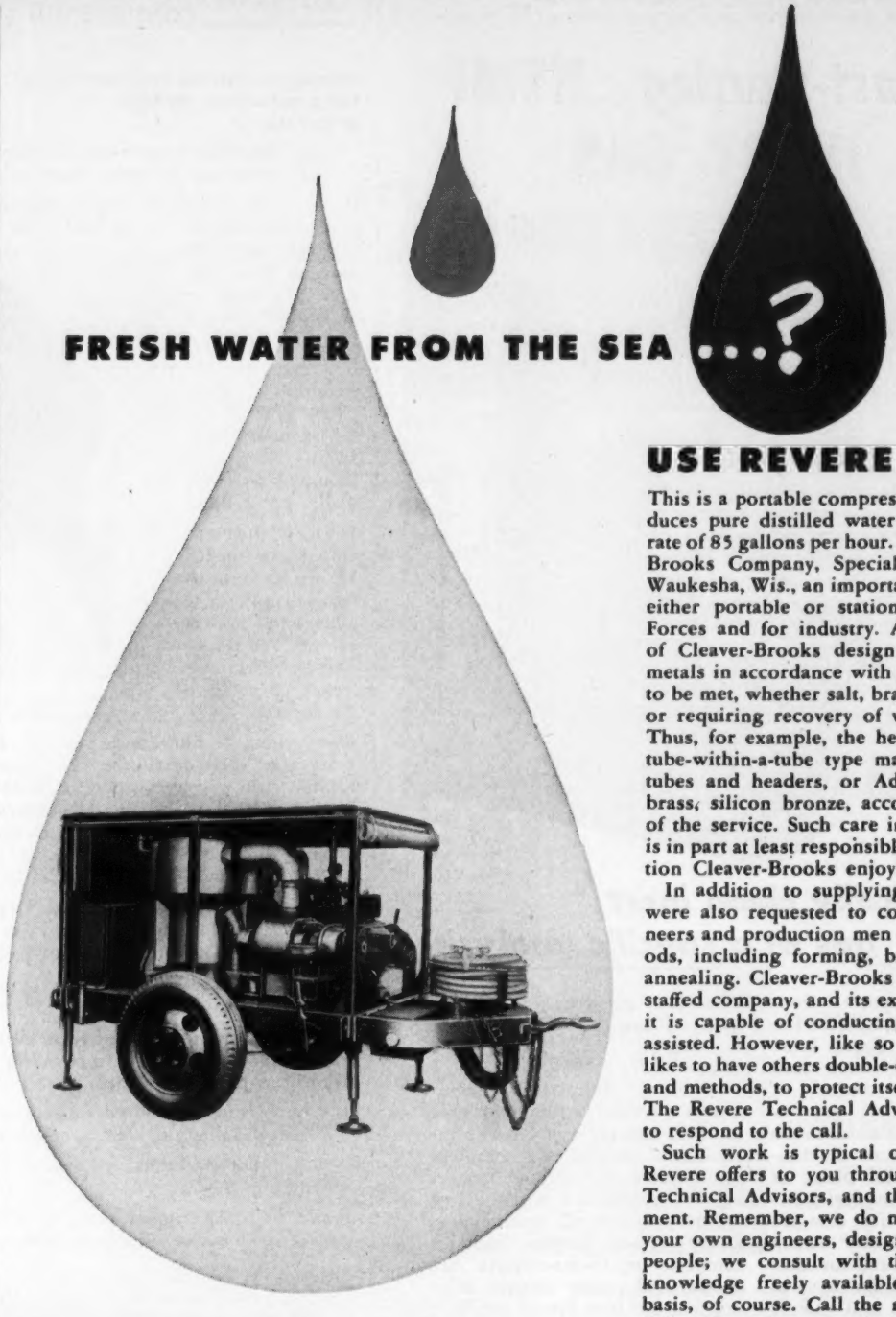
*Features*: Use of check valves and control station selectors in system makes it possible to change speed of Varidrive motors from any number of control stations. Conversely, any number of motors may be controlled by one station providing they operate at same speed.



**Photograph shows connection leading from motor to positioning unit and from positioning unit to remote control station**

*Description*: Pneumatic remote control consists of positioning unit which is designed to operate with air pressure of 60 or 100 psi. Positioning unit is an air operated plunger attached to the Varidrive speed changing device, and it is remotely controlled by an air valve. Four types of valve are available (pedal, cam, lever, or wheel) depending upon method desired to operate mechanism.

(Product of U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, Calif. . . . or for more information check CP 6304 on handy form, pages 2 and 3.)


**Portable Diesel-driven sea-water compression still, producing 85 gallons of pure water per hour. Made by Cleaver-Brooks Company, Special Products Division, Waukesha, Wis., which also makes stationary installations for chemical, paper, pharmaceutical and similar plants, for production of pure water or recovery of valuable by-products.**

**USE REVERE METALS!**

**This is a portable compression still, which produces pure distilled water from the sea at the rate of 85 gallons per hour. It is made by Cleaver-Brooks Company, Special Products Division, Waukesha, Wis., an important producer of stills, either portable or stationary, for the Armed Forces and for industry. An important feature of Cleaver-Brooks design is the selection of metals in accordance with the water conditions to be met, whether salt, brackish, contaminated, or requiring recovery of valuable by-products. Thus, for example, the heat exchanger, of the tube-within-a-tube type may have cupro-nickel tubes and headers, or Admiralty tubes, naval brass, silicon bronze, according to the nature of the service. Such care in selection of metals is in part at least responsible for the high reputation Cleaver-Brooks enjoys.**

**In addition to supplying Revere Metals, we were also requested to collaborate with engineers and production men on fabrication methods, including forming, brazing, welding and annealing. Cleaver-Brooks is a large and well-staffed company, and its experience is such that it is capable of conducting its operations unassisted. However, like so many companies, it likes to have others double-check its conclusions and methods, to protect itself and its customers. The Revere Technical Advisory Staff was glad to respond to the call.**

**Such work is typical of the collaboration Revere offers to you through its salesmen, its Technical Advisors, and the Research Department. Remember, we do not take the place of your own engineers, designers and production people; we consult with them, and make our knowledge freely available, on a confidential basis, of course. Call the nearest Revere Sales Office. Consult your telephone book or write direct.**

**REVERE**

**COPPER AND BRASS INCORPORATED**

*Founded by Paul Revere in 1801*

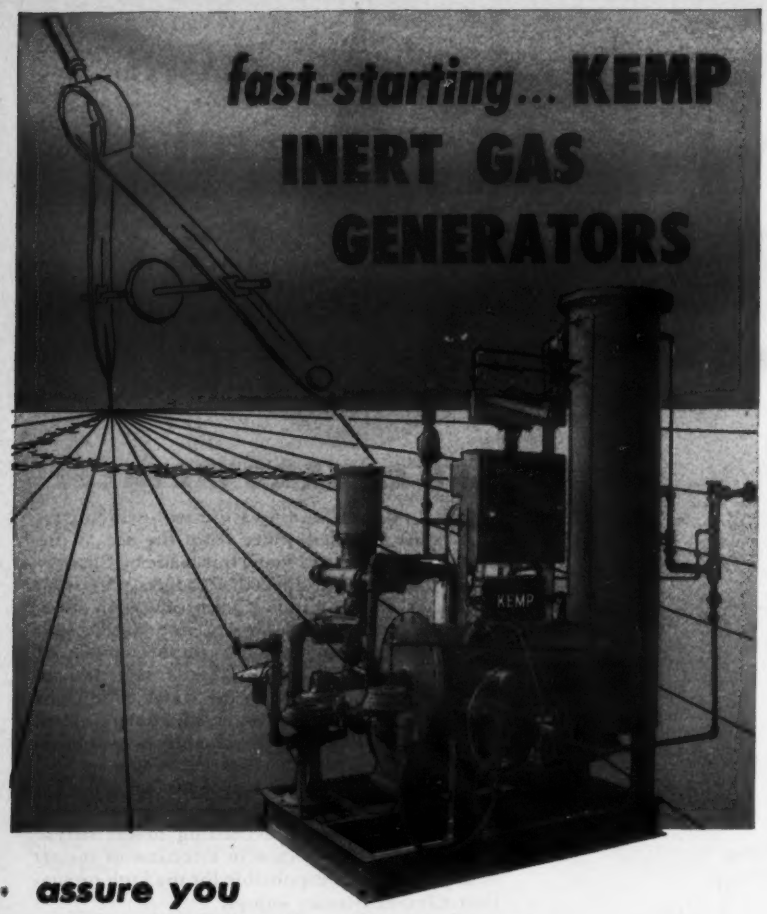
**230 Park Avenue, New York 17, N. Y.**

• •

*Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.— Sales Offices in Principal Cities, Distributors Everywhere*

**SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY**

When inquiring check CP 6305 on handy form, pgs. 2-3




• **assure you chemically clean inert gas at a specific analysis**

PERFORMANCE reports from Kemp users throughout the chemical field show: Kemp Inert Gas Generators produce and maintain a *specific analysis* of chemically clean inert gas *regardless* of demand. Eliminate the possibility of mixture fluctuations at some critical phase of processing . . . offer the *best* selection of versatile, flexible designs. And in addition, each Kemp Generator is engineered for fast-starting, easy operation so as to *save* you both time and money spent on the warm-up periods.

You can't go wrong when you specify Kemp.

***Set it . . . forget it!***

The Kemp Industrial Carburetor, standard equipment and the very heart of every Kemp installation, assures you complete combustion . . . without tinkering . . . without waste. Uses ordinary gas right from mains. Every Kemp Design includes complete up-to-the-minute fire checks and safety devices. Why not find out how Kemp can help you with your problems, today?

**KEMP OF BALTIMORE**

***INERT GAS GENERATORS***

*Write for Bulletin I-10 for technical information*

**THE C. M. KEMP MFG. CO.**
**405 E. Oliver Street, Baltimore 2, Md.**

When inquiring check CP 6306 on handy form, pgs. 2-3

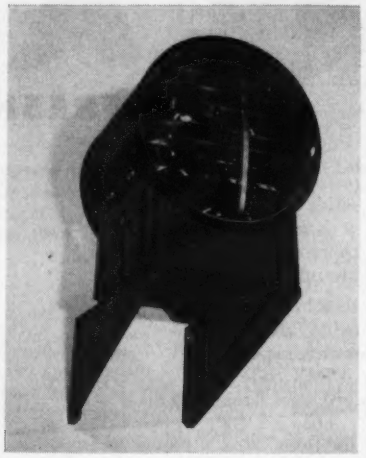

***Heater maintains constant temp for production, storage or curing . . .***

its adjustable louvers can be tilted to deflect warm air stream up or down about 20°

*Uses*: To maintain precise temperature control for production, storage, curing, and other processing stages. Heater may be used as basic heat source in plant or as supplement to central heating system.

*Features*: Model 20 KW of the Chromalox UB series is easily mounted on floor, wall, or ceiling.

It has thermal cutout to guard against overheating and adjustable aluminum louvers can be tilted to deflect warm air stream up or down 20 degrees.



Blower type heater is easily mounted in any location

*Description*: Blower-type electric heater consists of heavy-gage, sheet metal case with one or more Chromalox Koilfin strip elements sheathed with steel for safety. Blower operates on fractional horsepower motor. Heater functions on either 230 or 460 volts, single or three phase. Overall dimensions of 20 KW size are approximately 17 x 21 x 21 inches; and it weighs 79 pounds.

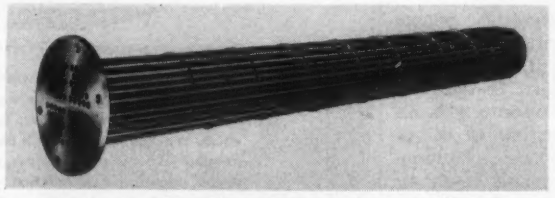
(Product of Edwin L. Wiegand Co., Dept. CP, 7611 Thomas Blvd., Pittsburgh 8, Pa. . . . or for more information check CP 6307 on handy form, pages 2 and 3.)

***Control refrigerant velocity in direct expansion evaporator to provide minimum pressure drop . . .***

liquid Freon is moved forward and agitated to prevent flooding in bottom or becoming oil saturated

*Uses*: For service in refrigeration and air conditioning systems.

*Features*: The liquid Freon in CWF (chilled water with Freon) coolers is moved forward and continuously



Tube bundle (shown above) is removable for replacement

agitated to prevent flooding in bottom or from becoming saturated with oil. Refrigerant velocity in tubes is controlled to provide minimum pressure drop with efficient transfer and without oil logging.

*Description*: CWF Direct Expansion Evaporator is constructed according to ASME specifications. It is tested


"Kick" TAKING THE OUT OF HOT CAUSTICS WITH FEON

**Dynel FILTER FABRICS**



Switching to FEON Dynel cut filter cloth costs over 50% on this filter press at the Exton, Pa. plant of Foote Mineral Company.

Hot caustic solutions, used in the production of lithium chemicals, had made short work of cotton fabrics. These liquids have practically no effect on Dynel.

One of the four FEON synthetics . . . Nylon, Orlon, Dynel, or Vinyon-N . . . can save on any tough filtration or dust collecting job that can be handled by fabrics . . . including yours. Want proof? Just write us today.




Fabric selector chart, technical data, case histories. Send for it today.

**FILTRATION FABRICS DIVISION**
FILTRATION ENGINEERS, INC.
**155 Oraton St., Newark 4, N. J.**

When inquiring check CP 6308 on handy form, pgs. 2-3

at 300 psi and certified for 150 psi working pressure. Tube bundle, through which refrigerant is moved, may be removed from shell for replacement. Tube bundle is constructed of copper with electro tin plated baffles.

Evaporator is available in shell diameters of 8-20 in two-inch increments and tube bundle lengths of 5-13 feet in one-foot increments. Baffles are spaced to provide proper velocity with minimum pressure drop through shell. Baffles are furnished in accordance with water quantities specified.

Heads are constructed with multi-pass circuits to permit proper flow of refrigerant and oil through the tube bundle. Refrigerant cycle is designed for use with standard thermal expansion valves or pilot controlled liquid valves.

(Product of Taco Heaters, Incorporated, Dept. CP, 137 South St., Providence 3, R. I. . . . or for more information check CP 6309 on handy form, pages 2 and 3.)

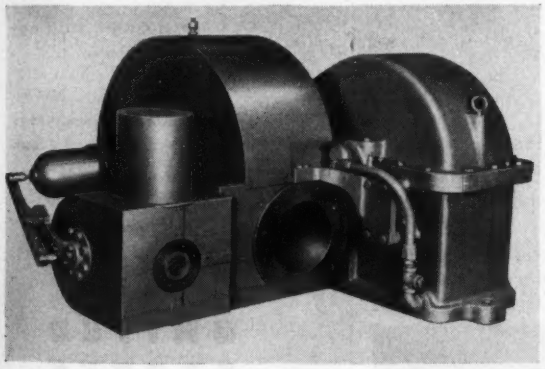
***Efficiency in turbine operation for several uses obtained with reduction gears . . .***

compact, durable high-speed units are available in built-in or coupled design

*Uses*: For mechanical drive turbines.

*Features*: Steam turbines operate most efficiently at relatively high speeds but many machines driven by them must run at lower speeds. Interposing reduction gearing of proper construction between turbine and driven machine permits efficient operation of both and widens field of application of turbine. These reduction gears, which are compact and rugged, are available with built-in or coupled design.

*Description*: High-speed reduction gear with built-in design has turbine and gear case firmly secured together.

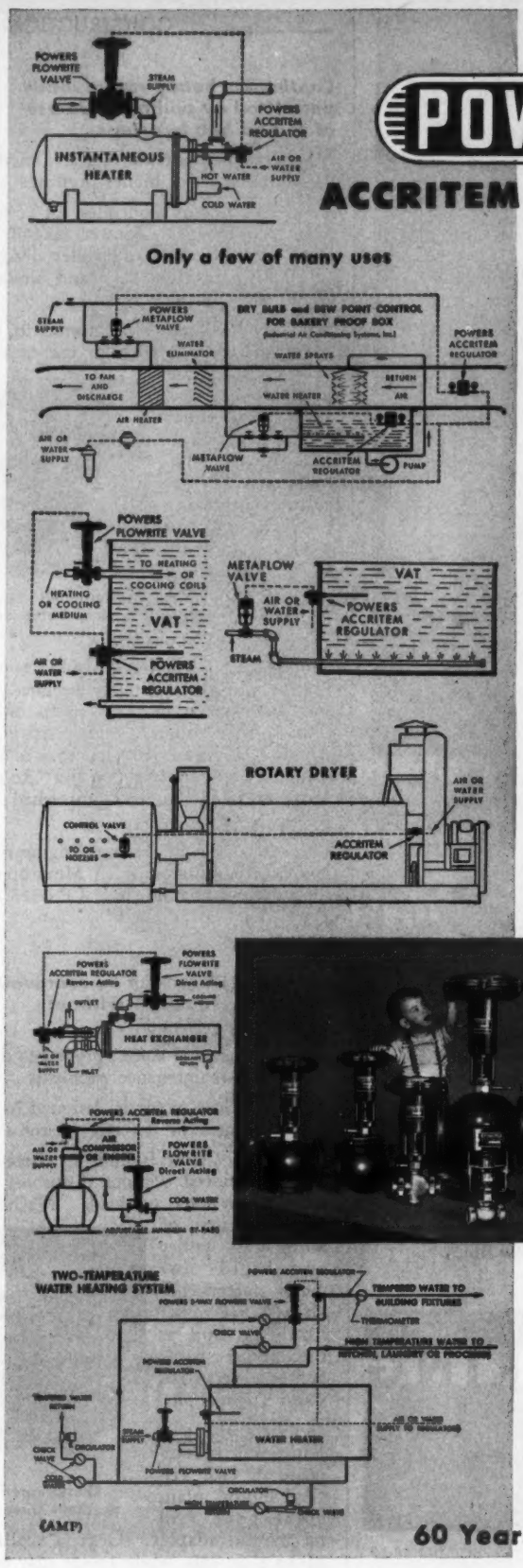


Built-in high-speed reduction gear for mechanical drive turbines

Turbine wheels and pinion are mounted on same high-speed shaft. This eliminates exhaust-end bearing and coupling, resulting in a unit of minimum overall length. Coupled design is self-contained gear unit which is flexibly coupled to separate turbine drive

Both designs have precision hobbed double helical gears, liner-type sleeve bearings, Kingsbury-type shaft seals, and self-contained forced feed lubrication systems. Units are offered in gear ratios up to 5:1 for built-in construction and up to 8½:1 for coupled design.

(Developed by Elliott Co., Dept. CP, Jeannette, Pa. . . . or for more information check CP 6310 on handy form, pages 2 and 3.)


POWERS

ACCRITEM REGULATOR




***Gives***

**Accurate, Low Cost Heat Control**

Use Accritem Regulators to control diaphragm operated valves or dampers. They save labor, stop losses caused by over-heating and have the following—

**IMPORTANT ADVANTAGES**

- ***Adjustable Sensitivity*** and over-heat protection.
- ***Calibrated Dial*** temperature adjustment.
- ***Simple, Rugged Construction*** withstands vibration and insures many years of reliable service.
- ***Temperature Ranges*** 50 to 250° F. and 150 to 350° F.
- ***Easy to Install*** Requires 15 lb. supply of compressed air or water for its operation.
- ***Small Size***—regulator head is only 2⅞" x 3⅝", sensitive bulb is 12" long with ½" I.P.S. connection.



**FLOWRITE and METAFLOW**
**Diaphragm Valves**
**controlled by a POWERS**
**ACCRITEM HEAT REGULATOR**
**provide an unbeatable combination for *better control and lower maintenance***

***Write for Bulletin 316***—or phone our nearest office for prices and further information about POWERS ACCRITEM regulators and diaphragm valves.

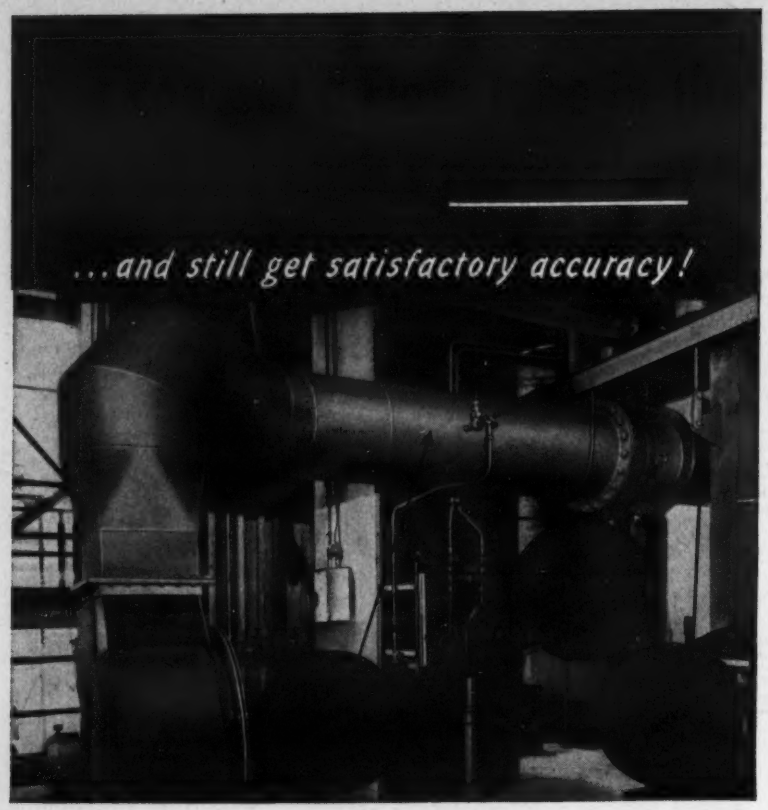
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**60 Years of Temperature and Humidity Control**

When inquiring check CP 6311 on handy form, pgs. 2-3




The Flow Tube needs only minimum straight runs entering and following the tube, and the Flow Tube itself takes up so little space that it can be installed at practically any accessible point where flow conditions are reasonably steady. This means considerable savings in space and equipment to provide straight entering runs required by conventional head meters.

The installation shown above in a catalytic cracking unit of a Southwestern oil refinery is a typical example. Here a 30" Flow Tube with a 23.9" throat (D/d=1.26) is measuring the air used to reactivate the catalyst. It delivers a differential of 10" of water for a maximum flow of 39,000 standard cfm at 137°F. and 3.5 psig. The unrecovered head loss in this Tube at maximum flow is 1" of water. Two other tubes are also operating under similar conditions in this refinery.

All are performing satisfactorily as installed. Periodic checks all show that they are measuring within plus or minus 2% of the blower manufacturer's characteristic curve.

Flow Tubes are manufactured exclusively by Foster Engineering Co. in all pipe sizes for measuring the flow of liquids and wet or dry gases. Flow Tubes can be furnished with or without suitable secondary indicating, recording, or totalizing instruments. For further information, ask for Bulletin FT-101; and for specific recommendations, please send us necessary flow data.

FOSTER ENGINEERING

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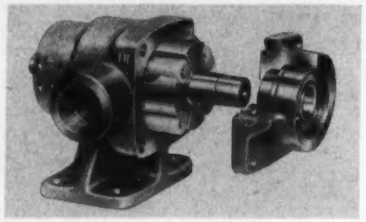
When inquiring check CP 6312 on handy form, pgs. 2-3

***Continuous heavy radial loads permitted by pump due to use of sealed ball bearings . . .***

performance tests indicate friction losses are minimized even at higher pressures

*Uses*: Design principles of pump were originally developed in tractor power take-off unit for weed and insect spraying. Pump's roller design is specially suited for use where lime, talc, and similar abrasive solutions are in use.

*Features*: Unit is engineered to withstand continuous heavy radial loads through use of sealed lubricated ball bearings. Pressed fit of stainless steel shaft into inner race of ball bearings restricts lateral movement of rotor, minimizing end thrust and wear of rotor within pump, even in upper range, performance tests indicate.



Restricted lateral movement of pump rotor decreases end thrust and wear

*Description*: Series 400 roller pump is available in cast iron or Ni-Resist. Unit is designed with scoop-type rotor and roller-type vanes, has nylon or Hy-Car water lubricated rubber rollers. Self priming, the pump delivers approx 7½ gpm at 100 lb pressure and 1750 rpm. Pressure range is from 0 to 200 psi. Recommended speeds are to 1800 rpm. Pump is furnished with ¾" ports and weighs 4½ lb.

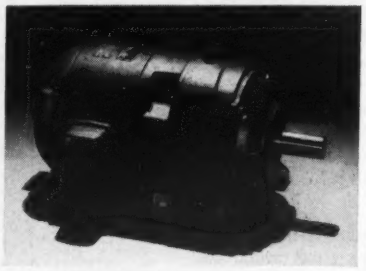
(Manufactured by Hypro Engineering, Inc., Dept. CP, 404 N. Washington Ave., Minneapolis 1, Minn. . . . or for more information check CP 6313 on handy form, pages 2 and 3.)

***Defective stator can be removed from 3-piece motor without disturbing gears . . .***

mechanical adapter proves to be "triple threat" to power maintenance problems

*Uses*: Gear motor is designed to simplify maintenance in replacement of defective stator.

*Features*: Unit is built in three pieces so that stator can be removed without disturbing gear components or gear connections to load. Mechanical adapter serves triple function of acting as pulley end-shield for motor, motor end-shield of gear housing, and as mechanical spacer for easy access to stator frame bolts.

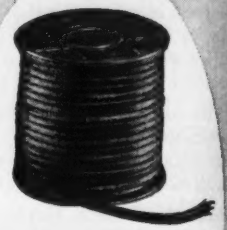


Close inspection of photograph shows three sections of motor

*Description*: Entire unit is composed of G-E Tri-Clad motor, planetary gear, and mechanical adapter. Gear is available in speed ratings of 13.5 to 780, while motor may be obtained in ratings from 1 to 200 hp. Openings are located at bottom of unit for ventilation.

MADE OF TEFLON*

CHEMISEAL



GENERAL-PURPOSE PACKING

Ask for No. 620EG (graphite impregnated) or No. 620EM (with mica.)

1. Inert to acids, caustics, solvents.
2. Good for temperatures from -110°F. to 500°F.
3. Anti-hesive — shafts and spindles operate freely.
4. For general stuffing-box applications.
5. Extruded in continuous lengths. Sold by the foot.

UGS

UNITED STATES GASKET COMPANY

FLUOROCARBON PRODUCTS DIV

CAMDEN 1 NEW JERSEY

*du Pont's trademark for its tetrafluoroethylene resin

FABRICATORS OF "TEFLON," "KEL-F" AND OTHER FLUOROCARBON PLASTICS

When inquiring check CP 6314 on handy form, pgs. 2-3

Stator can be changed by removing bearing-enclosure screws and bolts holding stator to motor adapter and front end-shield. Defective stator may be replaced by either round-frame stator or standard-motor stator with feet. If latter is used, it must be mounted upside down so that its feet do not interfere with gear-motor feet.

Design of three-piece motor is expected to cut stator replacement time in half and to minimize spare parts inventory.

(Product of General Electric Co., Dept. CP, Schenectady 5, N. Y. . . . or for more information check CP 6315 on handy form, pages 2 and 3.)

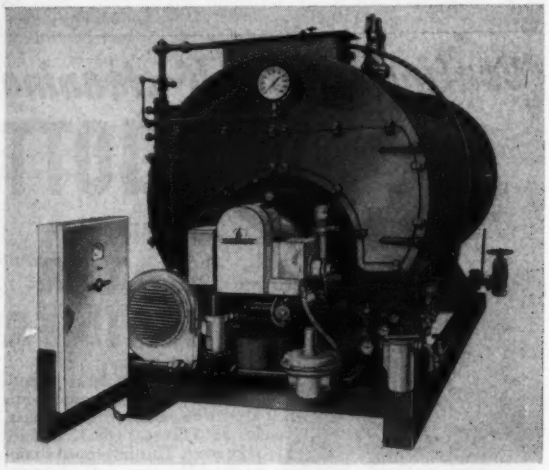
***Boiler-burner combinations for process steam, power, and heating . . .***

units consist of packaged burner with all controls and completely assembled boiler with accessories

*Uses*: Commercial and industrial applications for heating, power and process steam.

*Features*: Assemblies are completely integrated and compact. Available in wide variety of sizes. Can be fired with fuel oil and/or gas. Design of units eliminates necessity for high stack.

*Description*: Each unit consists of Iron Fireman packaged burner complete with all controls and Kewanee Scotch boiler, completely assembled with accessory equipment for oil, or oil and gas, or gas firing. Units available



**Completely integrated, compact units are designed for many uses**

for high pressure steam and water in sizes ranging from 52 to 304 hp, 125 and 150 pounds working pressure; also for low pressure 15 pounds steam or 30 pounds water in sizes from 1,808,000 Btu to 8,400,000 Btu. Can be fired with No. 6 or lighter fuel oil. Either high or lower pressure gas (as low as 2 oz) may be used. Boiler and burner arrive at job site in completely assembled condition. They are designed for forced draft operation. Merely need small vent extending above roof.

(Burner portion of packaged unit is product of Iron Fireman Co., Dept. CP, Cleveland 11, Ohio. Boiler is manufactured by Kewanee-Ross Corp., Dept. CP, Kewanee, Ill. . . . or for more information check CP 6316 on handy form, pages 2 and 3.)





In a career, just as in any journey, knowing when to make the right turn is of utmost importance. With 150 years of industrial leadership and achievement behind it, and a great expansion program ahead, Du Pont offers you an excellent opportunity for individual growth and technical achievement.

Consider seriously these vital factors and you will recognize the wisdom of turning to a Du Pont career:

**STABILITY** — 71 plants and 38 laboratories in 25 states;
**DIVERSITY** — 1200 Du Pont products serve industry and the consumer;
**CHALLENGE** — association with restless pioneering minds — vast research programs that have developed modern miracles like nylon, "Orlon" acrylic fiber, "Dacron" polyester fiber, neoprene chemical rubber, plastics;
**ADVANCEMENT** — a living Du Pont tradition that has seen engineers attain the majority of top executive positions in the company;
**SECURITY** — a company benefits program, unique in industry for its comprehensive coverage.

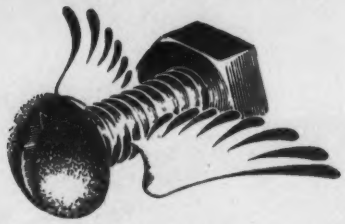
*Should you be interested in turning to Du Pont, please send complete resume, including educational qualifications to:*

Mr. T. J. Donovan

**E. I. du Pont de Nemours & Co., Inc.**

Engineering Department 113
Wilmington, Delaware

When inquiring check CP 6317 on handy form, pgs. 2-3



When you need

# STAINLESS STEEL FASTENINGS immediately . . .

# ANTI-CORROSIVE

is your best bet!

**Anti-Corrosive has millions of stainless fastenings *in stock* (probably the largest selection of varieties and sizes in the world) for *immediate delivery*. Anti-Corrosive has the exceptional production capacity that can fill your requirements beyond stock items faster, *better!***




**FREE—A-N Stainless Fastening Selector**

This handy slide-chart instantly identifies A-N Nos. pertaining to stainless steel nuts, screws, bolts, rivets, cotter pins, washers; gives sizes and other data. Write for "Chart 52E" TODAY!

25 YEARS OF LEADERSHIP IN FASTENINGS OF STAINLESS STEEL

**Anti-Corrosive** Metal Products Co., Inc.

**Manufacturers of STAINLESS STEEL FASTENINGS**

CASTLETON-ON-HUDSON, NEW YORK

When inquiring check CP 6318 on handy form, pgs. 2-3




***Barrel pump empties or fills variety of containers . . .***

handles wide range of liquids from oils to coolants

*Uses*: Unit may be used to handle motor oil, linseed oil, core oil, transformer oil, coolants, inks, thinners, and many other liquids.

*Features*: Pump is self-priming, continuous flowing, and non-dripping.

*Description*: Handle of pump is turned in one direction to empty barrel, turned in opposite direction to fill container. Spout is threaded for ¾" ID hose connection. Combination 1-½" and 2" bung nut is furnished. Fits ¾" suction pipe.



Handy barrel pump empties 55 gal drum in 8 to 10 min

Spout can be turned up to receive solvent or detergent for back flushing. Bronze vanes are self-aligning. Body of pump is machined steel. Seals are neoprene.

(Model 101 Pump is product of Engineered Equipment Co., Dept. CP, Box 207, Warsaw, Ind. . . . or for more information check CP 6319 on handy form, pages 2 and 3.)

***Neither heat nor flexing will cause V-ring packing to fail . . .***

rings molded endlessly with no joint or taper overlap

*Uses*: Primary application is as rod seal. Also used as piston seals, length permitting.

*Features*: No pressure-joined point to allow failure from heat or flexing.

*Description*: Periflex V-rings are molded from special neoprene compound. Mold design permits each ring to function automatically. Con-


# SAVE!

**Get Longer Service with**

**"Metalsmiths" Stainless Steel and Monel Utensils**



No matter where your plant, you can enjoy the durable service of "Metalsmiths" corrosion-resistant utensils. We've shipped utensils all over the world for more than 30 years, with utmost satisfaction. All items shown, plus beakers, stock pots, batch cans and shovels, in stock for immediate shipment.

**WRITE FOR LATEST CATALOG — PRICE LIST**

METALSMITHS

Division of **Orange Roller Bearing Co., Inc.**
556 White Street Orange, N.J.

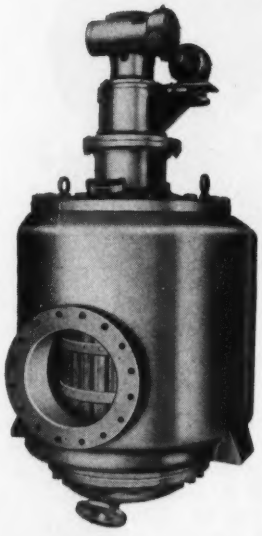
When inquiring check CP 6320 on handy form, pgs. 2-3

## Continuously self-cleaning

# ELLIOTT

**Type K**

# WATER STRAINER



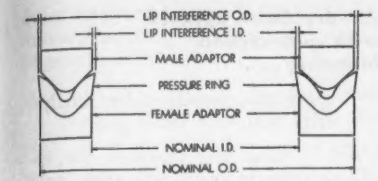
**When relatively large quantities of foreign matter and debris are to be removed from water, let an Elliott Type K strainer take over. This improved strainer actually cleans itself continuously by back-flushing each straining unit successively. No lost time, since operation is completely automatic. Slow moving rotor holds power costs down, even for the largest size units.**

**Sizes 4" to 36". Working Pressure — 125 lb. gage. Send for the complete story. Write for the Type K Self-Cleaning Water Strainer Bulletin.**

A 2-2

**ELLIOTT Company**
Accessories Dept. JEANNETTE, PA.
DISTRICT OFFICES IN PRINCIPAL CITIES

When inquiring check CP 6321 on handy form, pgs. 2-3




**Sectional view showing components and features of V-ring packing**

vex curve of internal lip surface allows each ring to function independent of adjacent rings and provides a lubricant reservoir. Increased pressures only tend to increase efficiency of the assembly.

Feature of rings is that they are molded with no joint or taper overlap. Neither heat nor flexing will cause them to split or fail as in case of rings molded from strip material having pressure-joined point. Lip interference automatically preloads packing in stuffing box, eliminating necessity of all but initial gland adjustment where split rings are used.

Packing comes in rings only — a set consisting of any given number of rings plus male and female end adaptors. Individual rings are available with machined metal end members.

(Packing is product of Periflex, Inc., Dept. CP, Hazel Park, Mich. . . . or for more information check CP 6322 on handy form, pages 2 and 3.)

***Inhibits corrosion on steel after cleaning . . .***

no drying prior to treatment

*Uses*: Protection of mild steel from corrosion after cleaning. It is stated to be superior to petroleum used for the same purpose.

*Features*: No need to dry steel prior to treatment as product has ability to displace and absorb up to 11% of its own volume in water without impairment of efficiency.

*Description*: Kelite M-2 may be applied by immersion, spray or brush. It is non-flammable (flash point 140°F), non-phenolic and non-toxic.

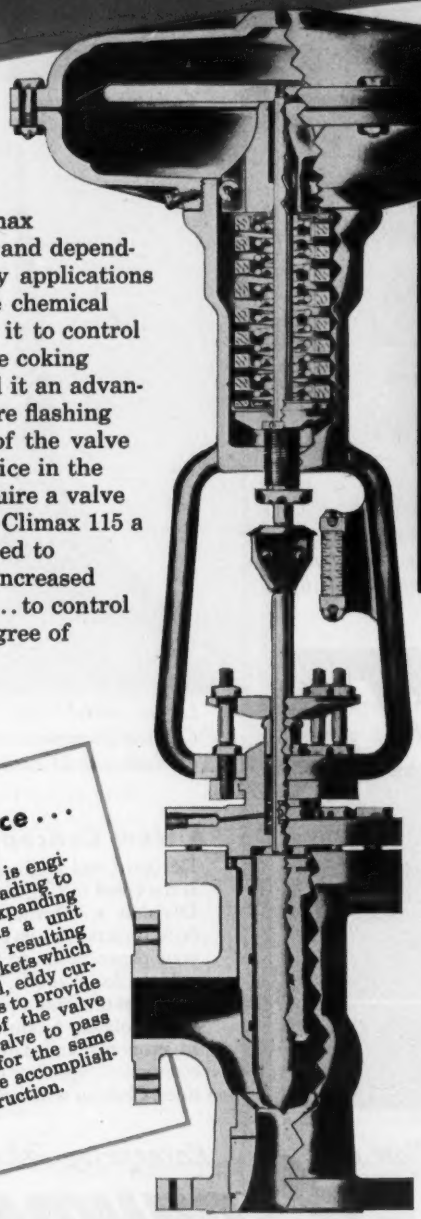
It will not burn the skin and its vapors are not harmful when inhaled.

(Details are available from Kelite Products, Inc., Dept. CP, 1250 N. Main St., Los Angeles 12, Calif. . . . or for more information check CP 6323 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 6324 . . . see information request blank between pages 2-3.


# a NEW BS&B Climax Control

## Designed For TOUGH Service in The Process And Power Industries



**NOW...** a new valve in the Climax family of precision built controls and dependable performers. There are many applications for this angle type valve 115. The chemical and refining industries will want it to control residual oils or liquids which have coking properties. Power plants will find it an advantage for high pressure drops where flashing occurs in the downstream side of the valve piping. Where tough, severe service in the process and power industries require a valve that will "take it", you'll find the Climax 115 a valve that will "do it". It's designed to control gases requiring greatly increased volume upon release of pressure... to control liquids that are subjected to a degree of flashing that would render an expanded outlet necessary.

**BS&B Climax Type 115* Expanded Outlet Diaphragm Control Valve**

***115-D— Air to close valve...opens with air supply failure**

**115-DRT—Air to open valve...closes with air supply failure**

The diaphragm motor mechanism in the Type 115 Climax is the same used in all Climax Type 86 Control Valves, selected for the particular service required. Pressure balanced top works can also be supplied. Type 115 is furnished with carbon steel angle type bodies in expanded outlet sizes—2" x 3" ...3" x 4"...and 4" x 6" with standard 150#, 300#, and 600# ASA flanges.

**For minimum turbulence . . .**

The valve body of the Climax 115 is engineered with a sweep flow inlet leading to a venturi throated valve seat expanding into the outlet...all designed as a unit for minimum turbulence. The resulting streamlined flow eliminates pockets which are the cause of flow reversal, eddy currents and erosion. It also tends to provide a maximum port efficiency of the valve which, in turn, allows the valve to pass greater quantities of fluid for the same diameter port than would be accomplished in a globe type of construction.

CLIMAX BS&B CONTROLS

BLACK, SIVALLS & BRYSON, INC.

CLIMAX CONTROLS DIVISION. DEPT. 4-M11

7500 East 12th St. Kansas City 3, Missouri



*Scale model tanker (⅛" to 1') made for demonstration purposes.*



*Loading racks provide multiple loading stations. Manifold lines under dock are easily connected to loading racks.*



*Larger model of a loading rack demonstrates flexibility of Chiksan aluminum marine and barge hose. Ship to shore connections can be easily handled by one man in a few minutes.*

CHIKSAN

**A New Concept in Engineering Procedure**

Designed and engineered to *your* particular needs and demands is the creed of Chiksan's Engineering and Research Development Division. • Whether it be a ⅜"swivel joint or an entire loading dock, Chiksan design engineers will work in close cooperation with your organization to find a practical solution to your problems. • Here, for example, is an illustration of how Chiksan solved the problems of a major petroleum refiner seeking to speed the loading of petroleum products from dock to tanker with the utmost in economy and safety. • If you have problems in the safe, economical, speedier conduct of fluids and gases through flexible lines, Chiksan will welcome the opportunity of working with you.

*The Flow of Enterprise Relies on*

CHIKSAN Ball-Bearing Swivel Joints

*Representatives in Principal Cities • Write for Catalog 51-C, Dept. 11-CP*

**CHIKSAN COMPANY • BREA, CALIFORNIA • Chicago 28, Illinois • Newark 2, New Jersey**

Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Chiksan Export Company (Subsidiary), Brea, California • Newark 2, N. J.




***Air-dry finish applied with split-second blending . . .***

spray gun blends paint, catalyst after materials leave gun

*Uses*: Gun was designed for applying recently developed epon resin paints.

*Features*: Spray gun gives rapid and correct blending of paint and catalyst.

*Description*: The hook-up for the catalyst painting system consists of



**Dual-feed head blends catalyst and resin paint in the air**

gun, air line, and lines for paint and catalyst; 2 pressure tanks (one for paint and one for catalyst); and gages and fittings. To assure correct feed-ratio of catalyst to paint, the same air pressure is used on both the catalyst and paint tanks. All fittings in system have standard pipe threads to facilitate hook-up and transfer of the equipment.

With the specially designed gun, catalyst and epon resin paint are mixed in the air, a split second before striking the surface to be painted. Resultant paint begins to cure as it strikes the surface. Blending is accomplished with a dual-feed head on gun. Spray gun is essentially a heavy-duty production gun with the precision catalyst feed system added. Exterior location of catalyst nozzles lets operator keep an eye on flow of catalyst.

(Special spray equipment is a product of Binks Manufacturing Co., Dept. CP, 3122 Carroll Ave., Chicago 12, Ill. . . . or for more information check CP 6325 on handy form, pgs. 2 & 3.)

For more information on product at left, specify CP 6326 . . . see information request blank between pages 2-3.

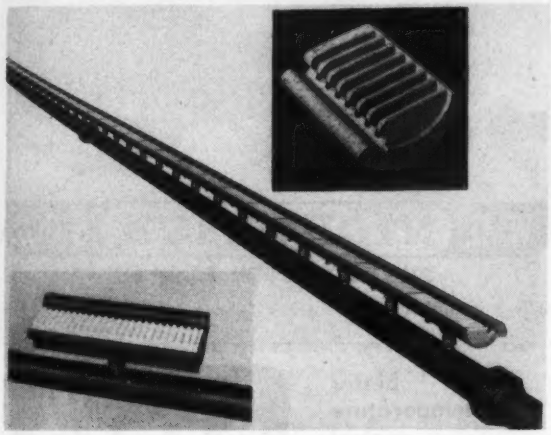
### *Build heaters to needs by merely adding sections of gas line burners . . .*

units of unique design are available in capacity ranges from 7000 Btu/hr to 45,000 Btu/hr

*Uses*: Radiant heating system may be applied to paint, mold, core, moisture, and other drying operations. Also useful for plasticizing, heat treating, aging, burn-off, billet heating, and other processes.

*Features*: Offers maximum rate of heat transfer, complete fuel combustion, reduced processing time, and minimum maintenance. Simple sectional design allows mounting of any number of units on common manifold to any length desired.

*Description*: Radi-Heat burners have design which eliminates fluted or internal baffles on which foreign matter can accumulate. Burner will not backfire or blow



Simple, sectional refractory design allows end-to-end mounting on manifold

itself out at any manifold pressure. Gas retaining section of refractory gives faster light-up, thus reducing amount of raw gas admitted to combustion chamber. Result of open-faced design is wide fanning radiation of heat. Burner has extremely wide range of mixture ratios and pressures.

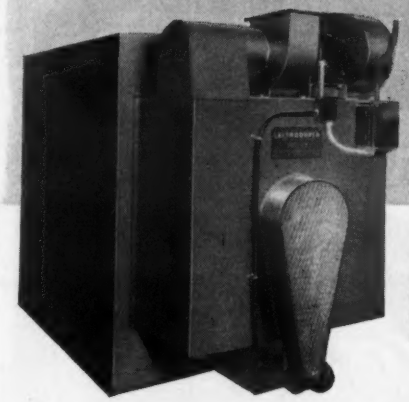
(Radi-Heat Burners are manufactured by Burdett Manufacturing Co., Dept. CP, 3433 W. Madison St., Chicago 24, Ill. . . . or for more information check CP 6327 on handy form, pages 2 and 3.)

### *How to avoid corrosion of boiler tubes*

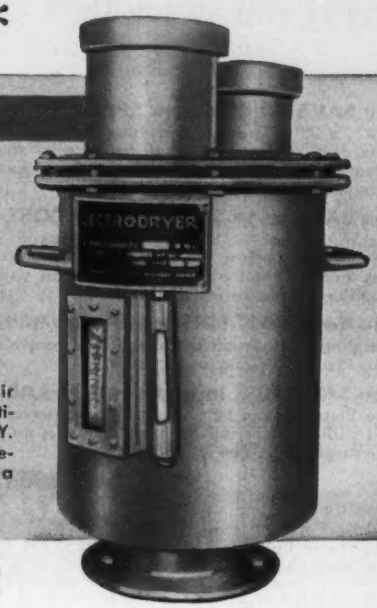
Corrosion as major factor in shortening life of boiler tubes is discussed in reprint of article which appeared in trade publication. Article indicates that in low pressure boiler, corrosion is largest single cause for replacement of boiler tubes. It points out various types and causes of corrosion and itemizes general rules to follow in order to get maximum service from boiler tubing. Photographs show various stages of pitting and corrosion in boiler tubes. Discussion is supplemented by graphs of such factors as fuel sulfur content and the relation between corrosion of steel and condition of boiler water. Bul TR-514 is available from Tubular Products Div., The Babcock & Wilcox Company, Dept. CP, Beaver Falls, Pa. When inquiring specify CP 6328 on handy form, pages 2 and 3.


# Put your storage tanks on a DRY air diet with Lectrobreathers*

*The moist air they're inhaling wastes money and destroys quality*



A tank breathes freely, as air passes through the charge of Activated Alumina and is dried DRY. When a Lectrobreather needs reactivation, it is lifted off and a spare takes its place.




Where volumes of air passing in and out of a storage tank are sufficient, a Lectrodryer* is used. Since its DRYing-reactivating cycle can be reversed as required, it stays right on the job.

A processor was buying certain liquids in drums, *at premium prices*, because the moisture in the air the storage tanks inhaled injured their quality. Then he discovered Lectrobreathers, which feed only DRY air to the tanks. Now he buys in tank-car lots, saving on raw materials, saving on handling and holding quality constant.

An oil company safeguards its fine lubricating oils against contamination by water from the time it is refined until it is safely packaged. They hold a blanket of DRY air over the oil by forcing the tanks to breathe through Lectrodryers that remove every trace of moisture from the air.

Lectrobreathers and Lectrodryers will make certain that any tank, little or big, breathes only DRY air. Which to use is determined by the size of the DRYing task: A Lectrobreather has a color indicator which tells when it should be reactivated. Operation of a Lectrodryer can be made fully automatic.

For help in selecting and applying the DRYing equipment you need, tell your problem to Pittsburgh Lectrodryer Corporation, 352 32nd Street, Pittsburgh 30, Pennsylvania.

In England: Birlec, Limited, Tyburn Road, Erdington, Birmingham.
In Australia: Birlec, Limited, 51 Parramatta Road, Glebe, Sydney.
In France: Stein et Roubaix, 24 Rue Erlanger, Paris XVI.
In Belgium: S. A. Belge Stein et Roubaix, 320 Rue du Moulin, Dressoux-Liege.

LECTRODRYERS DRY WITH ACTIVATED ALUMINAS

LECTRODRYER

*REGISTERED TRADEMARK U.S. PAT. OFF.

When inquiring check CP 6329 on handy form, pgs. 2-3

Now Available STAINLESS STEEL PLATECOILS
FIREPLACE PIPE COILS
to SAVE YOU 50% in TANK HEATING and cooling

**You SAVE 50% in tank SPACE**
A 22" x 47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. Platecoil thus saves about 50% over equivalent pipe coil in space inside your tank.

**You SAVE up to 50% in initial COST**
The initial cost of Stainless Steel Platecoil is often 50% or more below the cost of equivalent pipe coil. Less time is required to install Platecoil with corresponding saving in installation labor.

**You have 50% LESS WEIGHT to handle**
Weighing only about half as much as equivalent pipe coil, Platecoil is easy to handle.

**You SAVE 50% in maintenance LABOR**
The Platecoils can be replaced in a matter of minutes and without emptying the tank. There is no need for workmen to get inside the tank.

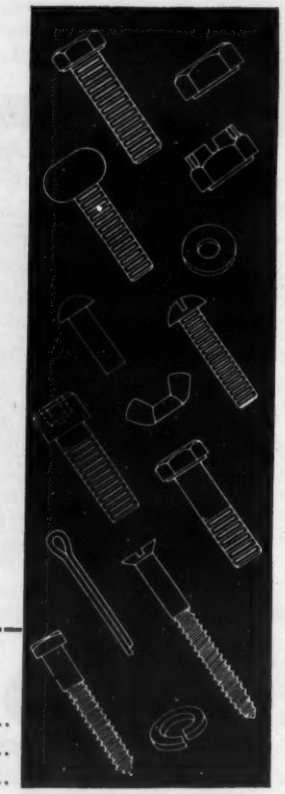
Send for complete technical manual and descriptive Bulletin No. P54
PLATECOIL
KOLD-HOLD MFG. CO.
LANSING 4 MICHIGAN

When inquiring check CP 6330 on handy form, pgs. 2-3



HARPER
HAS THEM!
*Everlasting Fastenings by the Dozen or the Million!*

- Specialists in bolts, screws, nuts, rivets, washers and fastening accessories!
- In brass, bronze, copper, aluminum, stainless steels, Monel!
- For all problems involving corrosion, heat, abrasion, stress, appearance!
- America's largest producer of non-corrosive fastenings!
- Larger stocks, greater selection —over 7000 items!
- Deliveries from nearby warehouse and distributor stocks!
- Ask for complete Harper Price List and Stock Book!



HARPER
EVERLASTING FASTENINGS

The H. M. Harper Company
8246 Lehigh Ave.
Morton Grove, Ill.
Rush Harper Price List and Stock Book.
Name.....
Address.....
City.....State.....

When inquiring check CP 6331 on handy form, pgs. 2-3


***Blast-action cleaner eliminates dangers and fire hazards of heavy duty cleaning . . .***

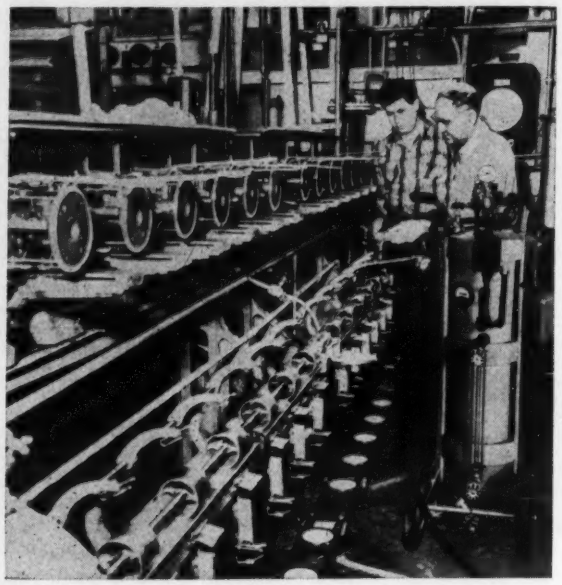
uses powerful jet of hot soap and water; solvents and detergents may also be introduced into jet

*Uses*: Cleans grease and grime from tractors, trucks, tanks, cars, and heavy-industry processing equipment.

*Features*: Combines effectiveness with complete freedom from fire and explosion hazards of fuel-fired equipment.

*Description*: The Speedylectric Hydrajet is designed to do heavy duty cleaning jobs which cannot be handled by ordinary wash deck equipment.

Four to eight gallons of scalding hot soap and water per minute at nozzle pressures up to 600 psi provide, under finger tip control of operator, a powerful, pulsating hydraulic jet which cleans away heavy accumulations that are not affected by other methods. In addition, cleaning action may be accelerated by introduction of suitable detergents or solvents at intervals or continuously in any desired automatically controlled concentration.



Jet-action cleaner combines effectiveness with complete freedom from fire and explosion hazards

Where central steam plant is continuously available, even at low pressure, cleaner can be easily installed, requiring only connections to existing steam lines and electric power sufficient for a 3-hp motor.

(Product of Livingstone Engineering Co., Dept. CP, 100 Grove St., Worcester 5, Mass. . . . or for more information check CP 6332 on handy form, pages 2 and 3.)

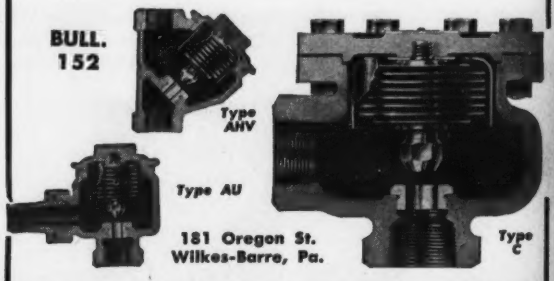
***Wrap a pipe in polyvinyl chloride to give it corrosion-resistant and pinhole-free coating . . .***

since tape is applied in the field, damage in transit is no longer a problem

*Uses*: Tape is wrapped around pipe to provide corrosion-resistant qualities in installations such as tank farms, chemical works, gas and water mains and service lines, and on magnesium-insulated steam lines. Tape may also


Leading Processors
CHOOSE 'FLEXIBLE' NICHOLSON TRAPS

**Because there is no need to change valves for varying operating pressures with Nicholson steam traps, they were recently adopted as standard by a large plastic molding firm. In addition to this flexibility, Nicholson traps offer these other advanced features: operate on lowest temperature differential; 2 to 6 times average drainage capacity; maximum air venting. 5 types; sizes ¼" to 2"; pressure to 250 lbs.**



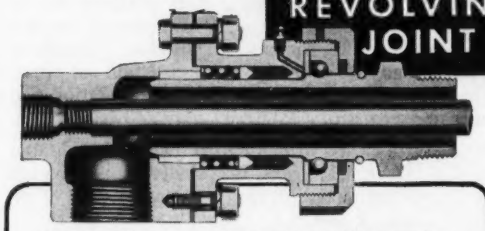

181 Oregon St.
Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.
TRAPS · VALVES · FLOATS

When inquiring check CP 6333 on handy form, pgs. 2-3



better temperature control . . . less maintenance
The Improved BARCO REVOLVING JOINT



HERE is Barco's new, *improved* Type IBR Revolving Joint for supplying steam, water, oil, or other fluids to rolls, dryers, drums.

**LOW TORQUE!** Inherent low torque little affected by pressure, speed or temperature—thanks to special ball bearing used in combination with self-lubricating graphite-carbon bearing and new low torque long-life chevron packing.

**LEAKPROOF AND LONG LIFE!** Note wide spacing between bearings. Insures close alignment and long life for self-adjusting, self-sealing chevron packing.

**EASY SERVICING!** Internal parts readily accessible—usually without removing joint from roll. Sizes ½" to 2". Single flow or syphon styles. Steam: 150 p.s.i., 450°F., 500 RPM. Hydraulic: 200 p.s.i., 750 RPM.



*Send for new Bulletin 300*
BARCO MANUFACTURING CO.
1837M Winnemac Avenue • Chicago 40, Illinois

When inquiring check CP 6334 on handy form, pgs. 2-3

be used for wrapping small diameter pipe, for wrapping sections of uncoated pipe, for resealing or repair jobs and for wrapping joints or couplings on mill wrapped pipe.

*Features*: Scotchrap pipe insulation combines anti-corrosion qualities of polyvinyl chloride and ease of application of pressure sensitive tapes. It eliminates need for tar pots and cumbersome equipment, yet provides corrosion-resistant, pinhole-free coating that can be applied easily and safely in single step. Tape is particularly serviceable for short jobs or inaccessible locations; and since application is made in the field, damage in transit is no longer a problem.

*Description*: Scotchrap tapes No. 50 and 51 have good dielectric qualities (10,000 to 22,500 v) and are non-absorbent and abrasion resistant. They are available in carton lots containing four or eight squares (100 sq ft



**Polyvinyl chloride tape can be easily and safely applied in single step by regular pipeline crew**

to square) depending on tape width. Rolls of 100 foot lengths may be obtained in widths of one, two, four, six, eight, and twelve inches. Tapes have 1½ inch core for adaptation to automatic or hand-operated pipe-wrapping equipment.

No. 50 insulation tape is 10 mils thick and is recommended for wrapping joints where conformability to irregular surfaces is desired. It has tensile strength of 25 pounds and adhesion strength of 25 ounces per inch width. Dielectric strength is 10,000 v and insulation resistance is 200,000 megohms.

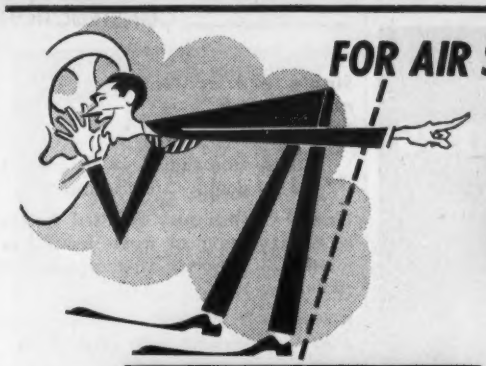
No. 51 tape is 20 mils thick and recommended for wrapping straight runs of pipe. It has tensile strength of 60 pounds and adhesion strength of 20 ounces per inch width. Dielectric strength is 22,500 v and insulation resistance is 200,000 megohms.

(Product of Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier St., St. Paul 6, Minn. . . . or for more information check CP 6335 on handy form, pages 2 and 3.)

### *Deals with features, uses of explosion-proof motors*

Twelve-page bulletin covers complete line of explosion-proof motors. Special features and typical uses are illustrated. Various electrical and mechanical modifications are outlined.

Bul 800 is issued by Louis Allis Co., Dept. CP, Milwaukee 7, Wis. When inquiring specify CP 6336 on handy form, pages 2 and 3.

**FOR AIR STERILIZATION OF HAZARDOUS AREAS**



**HANOVIA EXPLOSION-PROOF GERMICIDAL LAMP UNIT**

U. L. APPROVED

Entirely new. . . unique in design and construction. Flexible for either wall or overhead mounting, can be readily adapted for sterile hoods. Reflectors are provided for direct or indirect irradiation. All surfaces are rounded for easy cleaning and maintenance. The lamp is water-tight and ideal for areas requiring frequent washing.

Vulnerable areas in your plant can now be thoroughly protected! This remarkable unit is recommended for pharmaceutical manufacturers, biological laboratories, and for any industry in which you find locations subject to explosion hazards or where contaminated air affects the quality of the product. A leading pharmaceutical manufacturer has just installed one hundred units and others are considering similar action.

*Free Engineering Assistance Available*

GERMICIDAL EQUIPMENT DIVISION

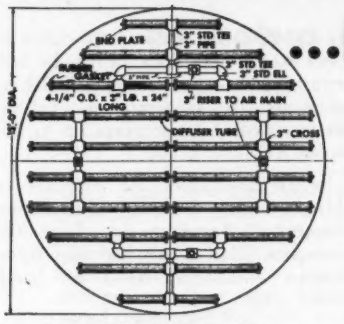
**HANOVIA** CHEMICAL & MFG. CO.

DEPT. L-11, NEWARK 5, N. J.

When inquiring check CP 6337 on handy form, pgs. 2-3

**FOR BETTER GAS-BUBBLE DIFFUSION**

**...in fermentation and chemical processes**

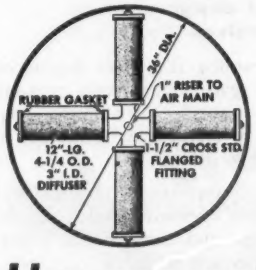



Typical grid of diffuser tubes for circular tank.

In practically any gas diffusion process (from dissolving volatiles with steam bubbles, to growing bacteria in oxygen bubbles) you'll get optimum diffusion *and absorption* by using ALOXITE aluminum oxide porous plates or tubes.

The highly uniform grain structure of ALOXITE material means you always get uniform, small bubble diffusion. And the glass-like ceramic bond which coats each grain presents a smooth, low-resistance surface that minimizes pressure loss or clogging.

ALOXITE diffusers are also inherently resistant to corrosion and can be safely used at working temperatures as high as 900°C. They are rugged enough to withstand repeated handlings. Various shapes are available for use in a wide range of equipment design.




Typical small sparger assembly.

**FREE BOOKLET.** May we send you our popular booklet on porous media? Its 56 pages cover all fields of filtration and diffusion. It gives pointers on specifying materials; outlines how to install, operate and maintain various units. Complete with photos, charts, etc. Address Dept. S-112, Refractories Div., The Carborundum Co., Perth Amboy, N. J.




**Use porous diffusers by CARBORUNDUM**

Trade Mark

*"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company*

When inquiring check CP 6338 on handy form, pgs. 2-3

# Concentrating Coke Fines
## for Profitable Recovery



AT the East St. Louis refinery of the Socony-Vacuum Oil Company, a Dorr thickener is proving thoroughly efficient in profitably recovering coke fines from process water.

These fines result from a hydraulic decoking process that removes coke from a coking drum. Most of the material is cut into large lumps for easy handling. An appreciable quantity, however, remains suspended in the water in the form of coke fines.

This water is pumped through a screened basin in the center of the Dorr thickener. Coke particles in the water gradually settle to the bottom and are gently moved to a discharge outlet by a slowly turning plow blade.

Clarified water overflows from the settling basin into the outer surge tank, which acts as a reservoir for water to be used over again for either cooling or cutting more coke from the coking drums.

The steel plate work for this Dorr thickener was fabricated by Chicago Bridge & Iron Company. It is another example of the many types of specialized steel plate work we do for all industry. Our large design, fabrication and erection departments are complete — and our four strategically-located plants mean better service throughout the country. We also have facilities at three of our plants to stress-relieve shop built pressure vessels and to pickle and paint fabricated steel plates and shapes by the Horton Phosphoric Acid Process.

Write our nearest office for information or quotations the next time you need steel plate or corrosion-resistant structures of any kind.

**CHICAGO BRIDGE & IRON COMPANY**

Atlanta 3 ..... 2107 Healey Bldg.
Birmingham 1 ... 1533 North Fiftieth St.
Boston 10 .... 1007—201 Devonshire St.
Chicago 4 ..... 2116 McCormick Bldg.
Cleveland 15 ..... 2212 Guildhall Bldg.
Detroit 26 ..... 1535 Lafayette Bldg.
Houston 2 ..... 2151 C & I Life Bldg.
Los Angeles 17 . 1536 General Petroleum Bldg.
New York 6 ... 3314—165 Broadway Bldg.
Philadelphia 3 . 1650—1700 Walnut St., Bldg.
San Francisco 4 ..... 1545—200 Bush St.
Seattle 1 ..... 1307 Henry Bldg.
Tulsa 3 ..... 1649 Hunt Bldg.
Washington 6, D. C. ..... 1158 Cafritz Bldg.

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

When inquiring check CP 6339 on handy form, pgs. 2-3

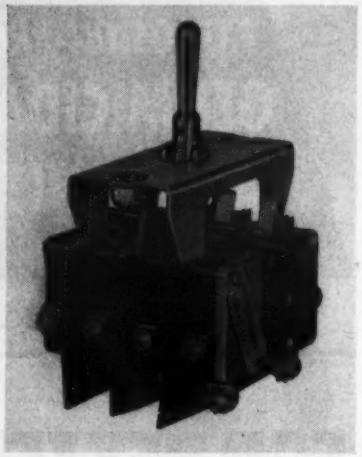

### *Single lever controls micro switch assemblies . . .*

units are available with from 1 to 10 double-throw elements

*Uses*: Units may be used in any electrical equipment where manual or mechanical multiple circuit control is required.

*Features*: Multiple switching elements are operated with single lever.

*Description*: Assemblies are available with from one to ten double-throw switching elements. Lever may



Single lever controls action of micro switch assemblies

be detented in center, and either or both extreme positions, or may be self-returning to the center. Switching elements are Underwriters' Laboratories listed at 10 amperes up to 250 volts AC.

(Switch assemblies are products of Micro Switch, Div. of Minneapolis-Honeywell Regulator Co., Dept. CP, Freeport, Ill. . . . or for more information check CP 6340 on handy form, pages 2 and 3.)

### *Details of design of gate valves*

Six-page catalog illustrates details of design of gate valves with cutaway drawing. Capsule description explains each feature as indicated in the drawing.

Complete information on material specifications, pressure and temperature ratings, and dimensional details and weights are included.

Cat 12-E is issued by Edward Valves, Inc., Department CP, East Chicago, Indiana. When inquiring specify CP 6341 on handy form, pages 2 and 3.

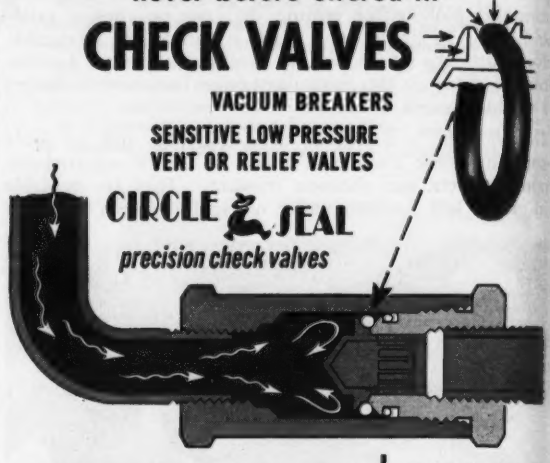

# the circle seal principle

*provides sealing assurance never before offered in*

**CHECK VALVES**

VACUUM BREAKERS
SENSITIVE LOW PRESSURE
VENT OR RELIEF VALVES

CIRCLE SEAL
*precision check valves*



**JAMES-POND-CLARK**

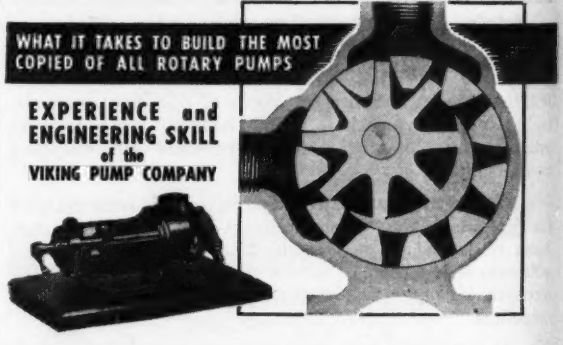
2181 E. Foothill Blvd., Pasadena 8, Calif.

Engineering data sent free of charge on request.

When inquiring check CP 6342 on handy form, pgs. 2-3

WHAT IT TAKES TO BUILD THE MOST COPIED OF ALL ROTARY PUMPS

EXPERIENCE and ENGINEERING SKILL of the VIKING PUMP COMPANY



Slide rule, graph and drawing paper are basic in developing rotary pump ideas.

The answer to Viking leadership, however, is beyond these basic materials.

Viking's store house of ideas holds thousands of feet of micro-filmed installation facts and drawings. Their use, plus continual experimenting and testing of new ideas produces results that make Viking the most copied of all rotary pumps.

*Send for descriptive folder 52SCC today.*

VIKING AN HONORED NAME IN PUMPING

Viking PUMP COMPANY Cedar Falls, Iowa

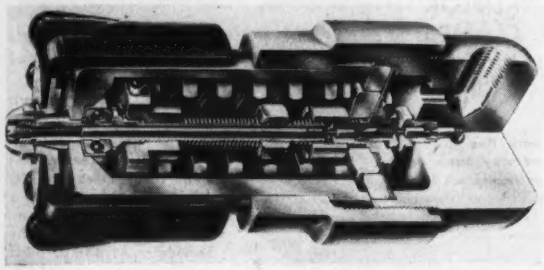
When inquiring check CP 6343 on handy form, pgs. 2-3

***Accurate control of small flows at high pressure is offered in regulators . . .***

self-contained, self-operating units maintain pressure after being set

*Uses*: For applications where control of relatively small flows at high pressures is required. Models are available for handling air, gas, or liquid. Units can be obtained for pressure reducing, pressure relieving, back pressure service, or combination pressure reducing and relief.

*Features*: Units are reported to be extremely accurate in applications for which they were designed. Regulators,



Sectional view of small volume high pressure regulator

which are compact, are entirely self-contained and self-operating. Once they are manually set, they automatically maintain the established pressure.

*Description*: Grove Small Volume Regulators all have essentially the same operating principle, with variations on some models. A decrease in system pressure actuates inlet valve to maintain set pressure. An increase in vessel pressure causes relief valve to bleed off excess pressures. Operating accuracy even at extreme pressures is obtained by maintaining large diaphragm-to-valve-orifice ratios.

Non-leaking seal has been made possible by precision finishing valve and seat. Valve seats are 18-8 stainless steel and valves are machined from molded nylon rod. Replacement of valves and seats requires only a few minutes. Diaphragms are made of one, two, or three layers of thin nylon film. Every regulator is equipped with inlet filter unit designed for gas services. On liquid service applications, filter should be replaced by another unit having sufficient capacity to maintain constant flow of clean liquid to regulator.

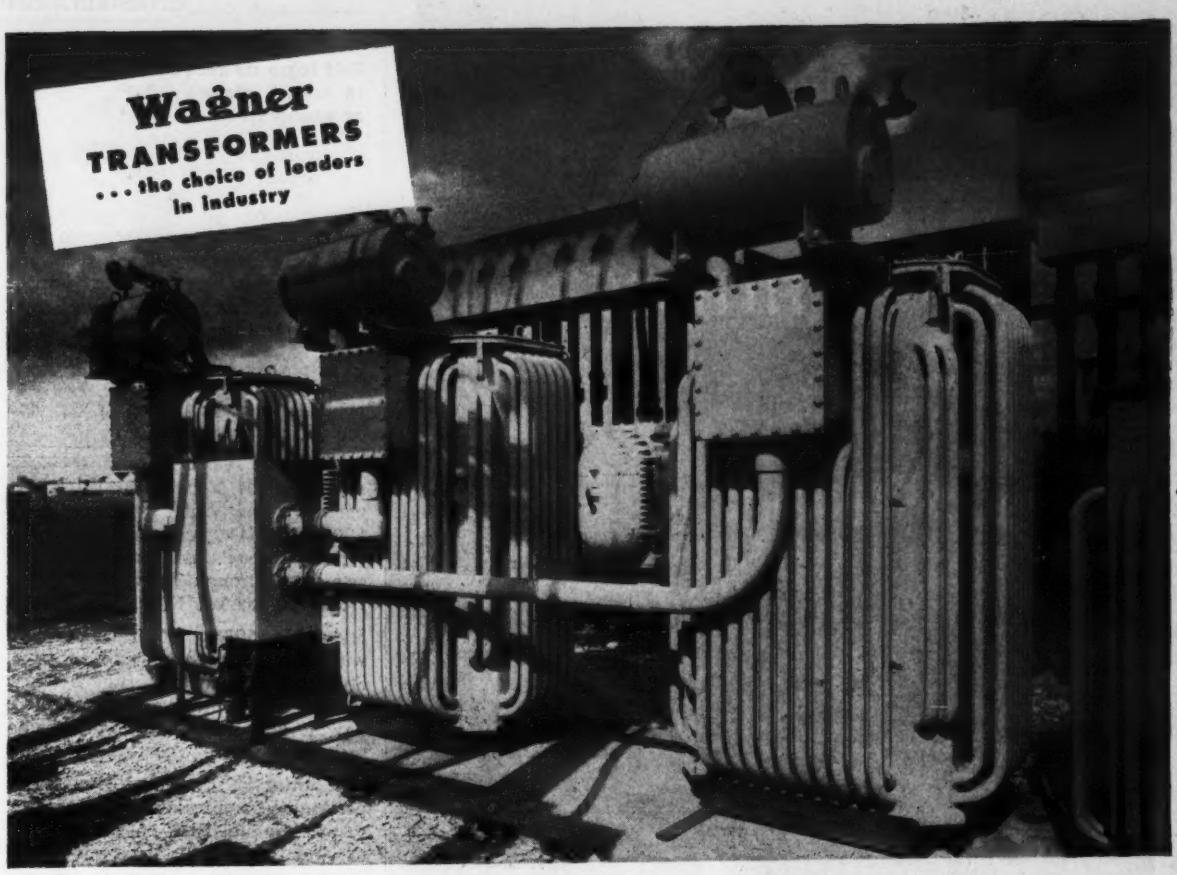
(Product of Grove Regulator Co., Dept. CP, 65th and Hollis St., Emeryville, Calif. . . . or for more information check CP 6344 on handy form, pages 2 and 3.)

***Manual helps to reduce maintenance costs***

Numerous products and hints are offered in 48-page booklet to help solve repair and building maintenance problems. Topics discussed include underfoot surfaces, roofs, sidings, wall surfaces, water-seepage and acid conditions.

Resurfacing compounds for use on various types of floors, floor patching materials, wall-treating compounds, and other materials for maintenance of roofs and walls are described. Numerous photographs illustrate results and uses of products.

Twenty-eight products are described and pictured. "Over the Rough Spots" is issued by Stonhard Co., Department CP, 1306 Spring Garden Street, Philadelphia 23, Pennsylvania. When inquiring specify CP 6345 on handy form, pages 2 and 3.

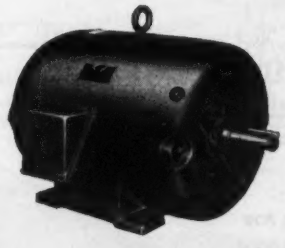




**Wagner Transformers power the production of Rohm & Haas "Chemicals for Industry"**

Production of "Chemicals for Industry" by the Rohm and Haas Company, makers of famed Plexiglas, is not a simple one-plant operation. The products of one of their plants may have no resemblance to the commercial products into which they are integrated at another plant. The natural raw material found in Texas, for instance—the processed chemicals manufactured there—and Plexiglas, an end product manufactured in another plant—are all part of a great modern production chain.

Power for production—with Rohm and Haas as with any modern industry—is provided by electricity. The manufacture of chemicals in the Rohm and Haas plant in Deer Park, Texas, is powered by Wagner Transformers and Wagner Motors. Wagner transformers in the main substation take energy at 69,000 volts and feed it to the low voltage substation at 2400 volts. The low voltage substation of Wagner transformers (illustrated above) in turn furnishes 480 volts to motors and to small air-cooled Wagner transformers which furnish 120 volts for lights and other single phase loads.

Wagner engineers are qualified to specify the proper transformers and motors for *your* requirements as well. Consult the nearest of our 32 branch offices or write us.



® Wagner Electric Corporation EST. WE 1891

WAGNER ELECTRIC CORPORATION
6359 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

W150-4A

When inquiring check CP 6346 on handy form, pgs. 2-3

FOR YOUR
STAINLESS STEEL
FITTINGS
AND FASTENERS
IT'S ALLMETAL
FOR QUALITY AND DELIVERY
Allmetal's fasteners and fittings are stocked in types 304 and 316. Specials to order. All made right by Allmetal.

ALLMETAL, Specialists in Stainless, Produce Stainless Products Exclusively.



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MANUFACTURERS SINCE 1929
ALLMETAL
SCREW PRODUCTS COMPANY, INC.
33 GREENE STREET NEW YORK 13, N. Y.

When inquiring check CP 6347 on handy form, pgs. 2-3

## CONSTRUCTION

***Felt tape adheres to metal, glass or wood . . .***

makes short work of sealing and gasketing

*Uses*: As sealing or gasket material to protect equipment from dust, air, fumes, and moisture. Pressure-sensitive, felt tape will also impede electrolysis, damp vibration, and resist flame, oil, fungus, or mildew.

*Features*: Felt tape has adhesive on one side; and it may be easily applied to metal, wood, glass, and ceramic surfaces.

*Description*: Six styles of pressure-sensitive, felt tape are available, depending upon specific application. No. 500 tape is intended for general service, and retains its adhesive characteristics through temperature range from –40° to 160°F.

Styles No. 507 and 508 are surfaced with solvent re-activated adhesive. Style No. 508 contains fungus resisting agent and chromate compound to provide non-drying and non-oxidizing seal.

All Spring-Felt tapes will not take permanent compression when exposed to pressure and heat, but will expand to virtual initial thickness when pressure is removed. Resins in impregnated felts are thermosetting. Plasticizers, chromates, and pigment fillers are inert.

(Product of Spring Packing Corporation, Dept. CP, 332 S. Michigan Ave., Chicago 4, Ill. . . . or for more information check CP 6348 on handy form, pages 2 and 3.)

***Controls ratio of flow from fully open to less than 1% . . .***

valve adapts use of "O" rings for positive shut-off

*Uses*: Designed for use with fluids, gases, air, or vapors.

*Features*: Use of "O" rings gives positive "bubble-tight" shut-off.

*Description*: Valve is equipped with spindle feature and micro-adjusting stem to allow ratio of volumetric flow to be controlled from fully opened to less than one percent of effective flow area through port.

"O" rings are fully protected from maximum to minimum line velocity. Cannot be blown off providing valve is installed correctly in relation to line flow.

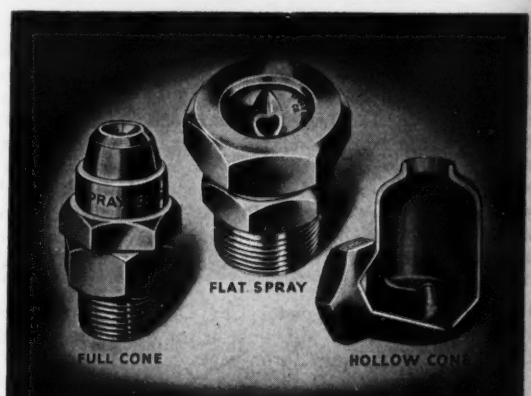
Shield prevents galling of seat in valve

✓CUT MAINTENANCE COSTS
✓INCREASE PRODUCTION
with this Famous TRICO Combination
"Powder-Packed" RENEWABLE FUSES



"KLIPLOK" CLAMPS for Fuse Clips
"Lock like a vise" and stay put. Pay for themselves many times over through great savings in power, fuses, clips.
It's the EXCLUSIVE TRICO "Powder-Packed" CUSTOM-BUILT renewal element that makes the BIG difference . . . Literally a fuse within a fuse that provides:—3 Times The Fuse Service . . . Tamperproof protection . . . GUARANTEED safe time-lag . . . Link protection and support . . . Life-time outer parts.
Reduce pre-mature fuse blowings
. . Heating and arcing at contacts
. . Eliminate burnt fuses and clips
. . Prevent unnecessary shutdowns.
WRITE FOR BUL. 1 & 6
TRICO FUSE MFG. CO., Milwaukee, Wis.
In Canada: IRVING SMITH LIMITED, Montreal

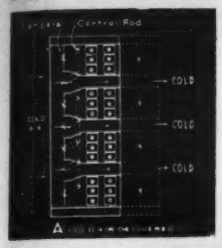
When inquiring check CP 6349 on handy form, pgs. 2-3




SPRACO NOZZLES
Write for NOZZLE CATALOG to
SPRAY ENGINEERING CO.
125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 6350 on handy form, pgs. 2-3

**FOR FRESH AIR SUPPLY, FOR DRYING FOR PROCESS HEATING**

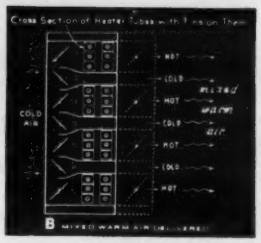


**• WING •**

**VARIABLE TEMPERATURE HEATER SECTIONS**

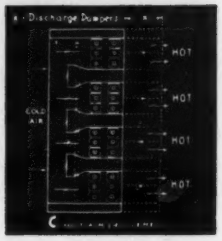
Highest heat transfer efficiency, lowest resistance to air flow, avoid expansion strains.

Cannot freeze even when the entering air is at a very low temperature—because the heating element is always under full steam pressure.



Tubes may be easily repaired or replaced—have leak-proof, steam-tight joints.

Built-in multiple by-passes insure uniformity of temperature without stratified hot or cold layers. Air streams mix almost instantly. Write for a copy of Bulletin HS-3.



**L. J. Wing Mfg. Co.**

179 Vreeland Mills Road
Linden, N. J.

*Factories: Linden, N. J., Montreal, Canada*
*Offices in Principal Cities*

When inquiring check CP 6351 on handy form, pgs. 2-3



**IT'S NEW! IT'S UNIQUE! IT'S PRACTICAL!**

**The *Junior* CHIL-ER**

**PORTABLE CONTROLLABLE RERIGERATOR UNIT**



**REQUIRES NO OUTSIDE WATER CONNECTIONS REFRIGERATOR UNIT.**

Provides maximum portability with thermostatic temperature control over a wide range of operation. For automatic recirculation of cold water, brine and other liquid coolants.

Available in seven models from ¼ HP to 3 HP with pump capacities from 1 to 10 G.P.M.

The range with water is from 38°F. to 60°F.; with brine, -22°F. to+50°F.; with an extra heating element, from 60°F. to 140°F.

The Junior supplements our standard Chil-er line with capacities from 3 to 150 tons. Write for full specifications and prices.

**MAYER REFRIGERATING ENGINEERS, INC.**

RUTHERFORD, • NEW JERSEY

When inquiring check CP 6352 on handy form, pgs. 2-3




Stainless steel valve uses "O" rings for positive shut-off

body as it does not revolve when two parts are in contact.

Valve is available in ¼ and ½" sizes, globe and angle type. Made of stainless steel. Temperature limits — plus 225°F.

("Throttleseal" Valve is a product of Daniel Orfice Fitting Co., Dept. CP, Los Angeles, Calif. . . . or for more information check CP 6353 on handy form, pages 2 and 3.)

***Engineering data for unit heaters***

Forty-eight-page bulletin reviews engineering data and applications for vertical and horizontal shaft unit heaters.

Features, description, component parts, and dimensions are included for both types of units. In addition expanded steam and hot water capacities are tabulated. Steam capacities are listed up to 50 psi at 50, 60, or 70° entering air. Hot water data include capacities at 180° and 200°. (All temperatures are °F.)

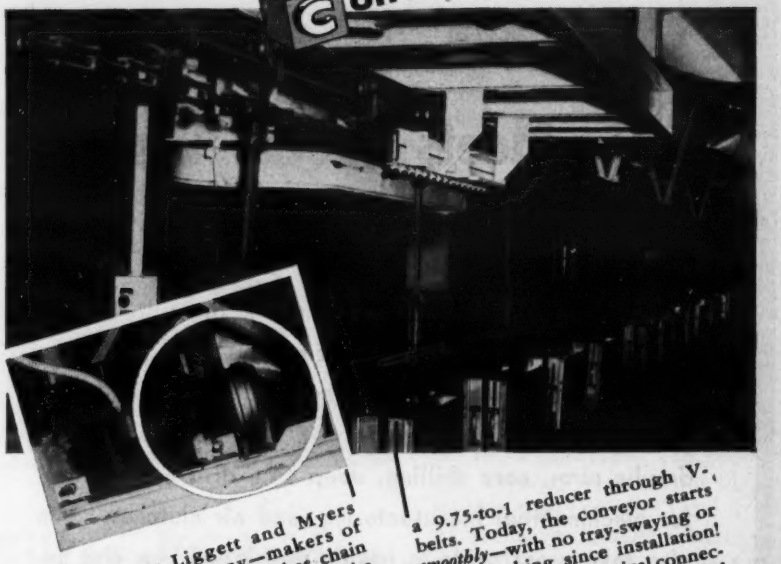
Special sections are devoted to selection and application of both types of units and motor control specifications. Piping illustrations and installation suggestions for both steam and hot water are included.

Bul 3570 is issued by American Air Filter Co., Inc., Dept. CP, 215 Central Ave., Louisville, Ky. When inquiring specify CP 6354 on handy form, pages 2 and 3.

Processing & Engineering Data section on pages 188, 190, 192, & 194


**TWIN DISC HYDRO-SHEAVE®**

**Adds Balanced performance to any Conveyor**



**PROBLEM:** Liggett and Myers Tobacco Company—makers of Chesterfield cigarettes—has chain conveyors up to ⅓ mile long in its big Durham, N. C. plant. Traveling 60 feet per minute, one of the long conveyors hustles loaded trays from cigarette machines to package room. With straight mechanical drive, starting the conveyor was difficult without chain breakage and swaying of the trays.

**SOLUTION:** A Twin Disc 8.4" HYDRO-SHEAVE Drive was mounted on the 5 hp, 1750 motor, driving a 9.75-to-1 reducer through V-belts. Today, the conveyor starts *smoothly*—with no tray-swaying or chain-breaking since installation! By eliminating mechanical connection between power source and driven equipment, the HYDRO-SHEAVE *absorbs* starting and running shocks—lets the motor accelerate rapidly and easily—adds balanced performance throughout.

For further information on Twin Disc HYDRO-SHEAVE Drives, write today for Bulletin No. 145-B.

Twin Disc HYDRO-SHEAVE® Drives —in capacities from ¾ to 50 hp —solve many shock load, vibration, and excessive starting current problems throughout industry.

Built for a Long Life . . . Backed for a Lifetime

**TWIN DISC**
CLUTCHES AND HYDRAULIC DRIVES

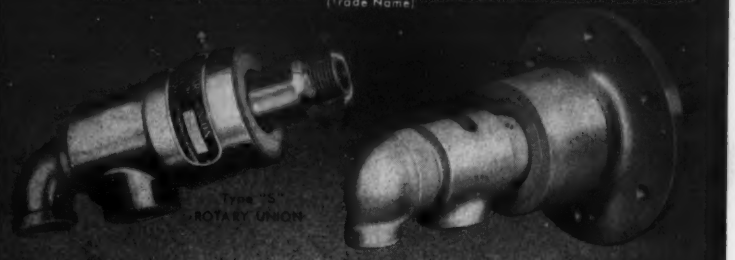
**TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois**

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

When inquiring check CP 6355 on handy form, pgs. 2-3

# ROTARY UNIONS

(Trade Name)




A REVOLVING STEAM CONNECTION

Pipe sizes ¼" through 3".



## Meets Special Demands of Industry and Defense

Our engineers have overcome many difficult sealing problems for which no standard models were available. A few of these covered high pressure dryers with 200 PSI steam, hot water applications with 300 PSI, actuating hydraulic rams, core drilling, deep hole drill applications for machine tool manufacturing, and air clutches. We also take great pride in having developed new and unusual sealing methods for the U. S. Armed Forces.

Call one of the offices listed below for consultation on *any* sealing problem, or write Dept. 11C for our catalog.

"Where *Good Connections* Count" ®

**PERFECTING SERVICE COMPANY**

332 Atando Avenue (Home Office and Factory) Charlotte, N.C.

Atlanta, Chicago, Cleveland, Philadelphia, Providence, New York, Montreal, Toronto


When inquiring check CP 6356 on handy form, pgs. 2-3



***More heat, little light from infrared heater, dryer units . . .***

radiation is even and only a faint glow of light emitted

*Uses*: In drying, baking, dehydrating, and various other heat processing operations.

*Features*: Heat is even: hot spots are eliminated. Tube emits only a faint glow of light — for protecting light-sensitive colors.

*Description*: Merco infrared heater and drying units contain no gas, reduce fire hazards since they cannot explode. Tube is designed to resist thermal and mechanical shock.

Units require no sockets, only two connections as contrasted to six sockets and twelve connections as found in an ordinary bulb oven that covers 4′ area, manufacturer reports.

(Distributed by Corona Manufacturing Corp., Department CP, 5210 San Fernando Road, Glendale 3, California. . . . or for more information check CP 6357 on handy form, pages 2 and 3.

***Painting may be done without walls being dry . . .***

means less time-out in normal operations for painting

*Uses*: On almost any type of interior surface — plaster, masonry, concrete block, wood, wallboard, nonferrous metal—painted or unpainted.

*Features*: Presence of water in the formulation makes the paint "at home" on damp surfaces, so that painting may be done without waiting for walls to dry completely—this means less interruption of normal operations for painting.

*Description*: Arcotone Vel-Lure is a polymer-emulsion material containing a high proportion of pigmented latex. It dries in 20 minutes and is stated to be without odor. It is easily brushed, sprayed, or roller-applied.

Because brush marks and uneveness disappear when coating has dried, excessive "working over" is eliminated to a large extent.

A range of 20 colors is offered, and product is being marketed exclusively to painting contractors, maintenance departments of plants, and factories.

(Product of The Arco Co., Dept. CP, 7301 Bessemer Ave., Cleveland 27, Ohio . . . or for more information check CP 6358 on handy form, pages 2 and 3.)


# J. E. SIRRINE CO.

GREENVILLE • SOUTH CAROLINA

*Engineers*

ESTABLISHED 1902

PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL • METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL • WATER SUPPLY & TREATMENT • ANALYSES & REPORTS


When inquiring check CP 6359 on handy form, pgs. 2-3


# GET THIS NEW DRUM PUMP *Idea Book!*

***New ideas in fluids handling***

May we show you what this amazing little Fast-Flo Drum Pump has done in industry after industry? An air-operated reciprocating pump, the 13½ lb. Fast-Flo operates on air as low as 35 PSI. It screws directly into 2" drum bung openings, or can be clamped on tank sides. *And Fast-Flo does not pressurize drums!*

Fast-Flo can transfer, agitate, dispense . . . and be used as a supply pump for applying, mixing or spraying. It handles an almost unbelievable range of materials, many as thin as isopropyl alcohol, many as thick as cookie frostings.



SEND FOR *FREE* COPY



**GRACO** *Fast-Flo* UNIVERSAL DRUM PUMP

One of the applications in this new Fast-Flo book may suggest a better way to handle one of your operations, saving time, labor and money. Write today!

**GRAY COMPANY, INC.**

13 GRACO SQUARE • MINNEAPOLIS 13, MINNESOTA

Regional Offices: New York, Philadelphia, Detroit, Chicago, Atlanta, San Francisco


When inquiring check CP 6360 on handy form, pgs. 2-3

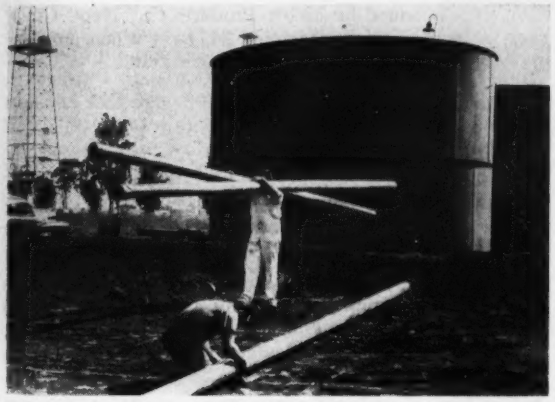
***Improve physical properties of plastic pipe for pressure transmission . . .***

notable advances in heat resistance and pressure range, plus largest pipe sizes available

*Uses*: Corrosion-resistant, pressure transmission piping.

*Features*: Improvement of plastic pipe in factors such as allowable pressures, resistance to heat and impact loads, physical properties at extreme temperatures, and production of largest size plastic pipe on market.

*Description*: Glass fibre-reinforced thermosetting plastic pipe has operating temperature range from –90 to 230°F. Working pressure of Reflin pipe is 200 psi and



**Corrosion-resistant plastic pipe can be laid by two men under average terrain conditions**

burst pressure is 1000 psi. Twenty-foot lengths of pipe are available in standard 4, 6, 8, and 10 inch OD sizes. Piping has smooth wall surface to discourage attachment of mineral and biological deposits found in pressure transmission lines.

Material is resistant to most salts, acids, hydrocarbons, and natural corrosive elements. It will withstand aging or weathering in installations above or below ground: it is not subject to electrolytic corrosion.

Pipe is lightweight and rigid. It uses standard fittings and simple tools to complete leakproof joints. Connections are made by sleeve-type couplers, "Resin-Wrap" joints, quick couplers, and other methods readily handled in field. Pipe can be laid by two men under average terrain conditions. Reflin pipe is adaptable to all standard auxiliary equipment including valves, pumps, and tanks.

(Product of Reflin Co., Dept. CP, Gardena, Calif. . . . or for more information check CP 6361 on handy form, pages 2 and 3.)

***Reports on value of uniform gear tooth stresses***

Photographs of seven processing stages for manufacturer's gears are included in four-page bulletin. Each step is reported to contribute to precision gears and uniform tooth stress in operation. Publication emphasizes waste loads and decrease in gear life which result from incorrect gear tooth stresses. Range of gears available is listed with dimensional sizes. "Gear Errors Are Costly" is issued by Sier-Bath Gear & Pump Company, Dept. CP, 9252 Hudson Blvd., North Bergen, N. J. When inquiring specify CP 6362 on handy form, pages 2 and 3.




# The Simplest Filter Cartridge Lasts the Longest...Twice as Long

Cartridge renewals are cut at least *in half* when Cuno MICRO-KLEAN replaces any other filter. And throughout its service life, MICRO-KLEAN is *guaranteed* for specific performance.

CUNO

*Fluid Conditioning*

**Removes More Sizes of Solids from More Kinds of Fluids**

**Strain** fuels, lubricants, process fluids, etc.—AUTO-KLEAN
**Filter** fuels, lubricants, process fluids, etc.—MICRO-KLEAN
**Clean** raw water, recirculating water, etc.—FLO-KLEAN

## Less Expensive "Felted" Filter Does Most Clarifying Jobs Better

Many chemical firms, faced with a fluid-filtering problem, turn to a Cuno MICRO-KLEAN filter for the solution.

In most cases, the MICRO-KLEAN gives perfectly satisfactory clarification and for less cost—measured in money and maintenance—than other types.

The MICRO-KLEAN cartridge is a simple, compact structure of "felted" fibres, with no internal or external supports to take up space and complicate installation. Instead of periodically *renewing* the filter, the inexpensive cartridge is thrown away and replaced—quickly and with no mess.

The MICRO-KLEAN cartridge is mechanically strong, due to resinous impregnation and polymerization. It won't swell or shrink, soften or harden, rupture or channel—or otherwise release contaminants.

MICRO-KLEAN'S greater dirt-holding capacity means fewer cartridge changes, larger batches per set of cartridges. The greater dirt capacity comes from maximum porosity (85-90%) and from its exclusive "graded density in depth", permitting smaller particles to penetrate further, rather than "loading" the surface.

Cuno MICRO-KLEAN handles a wide range of fluids with low pressure drop, and is guaranteed to remove 100% of all solids for which it is rated* plus a large percentage down to 1 micron.

*10, 25, 50 microns.
Capacities: a few to over 800 gpm.

Cuno Engineering Corporation
Dept. 163C, South Vine Street, Meriden, Conn.
Please send information on Cuno MICRO-KLEAN for following service.....
Name.....Title.....
Company.....
Address.....
City.....Zone....State....
Please attach to business letterhead

When inquiring check CP 6363 on handy form, pgs. 2-3




It's called Alcoa Utilitube*. If you use coiled tube, Alcoa Utilitube may very easily cut your tube costs by 40%.

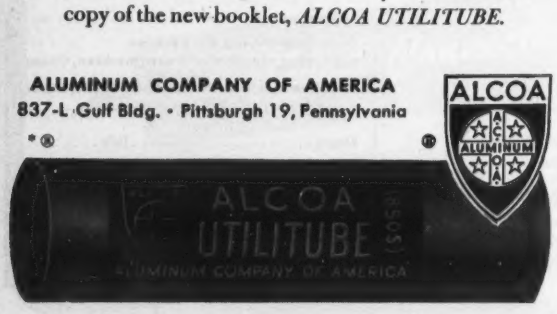
Use it where corrosion is a hazard . . . for fuel and lube lines . . . for hydraulic fluids . . . for air and refrigerants. It will not gum or sludge in petroleum service nor will it discolor or contaminate the fluids it carries.

Forming, flaring and bending are as easy as with annealed copper . . . and Alcoa Utilitube work hardens less. At sub-zero temperatures it actually gets stronger.

Utilitube and fittings are available from your aluminum distributor. Look for his name in your classified telephone directory. Write for a copy of the new booklet, *ALCOA UTILITUBE.*

**ALUMINUM COMPANY OF AMERICA**
**837-L Gulf Bldg. • Pittsburgh 19, Pennsylvania**

*® ®




When inquiring check CP 6364 on handy form, pgs. 2-3


# New Literature

### Colorful bulletin presents features of motor design

Nineteen features of design and construction are incorporated in complete line of motors. Primary use of units is as power supply for pumps. Bulletin illustrates motor with accompanying drawings of individual features in full color.

Engineering data include discussions of tandem bearings, dual balancing of rotors and the complete motor assembly, use of automatic backstops (of which there are two types) for preventing motor from spinning backward, comparisons of solid-shaft and hollow-shaft designs, and description of lubrication system.

Range of vertical motors extends from 1½ to 400 hp. Other features are streamlined design, oil gages set flush with surface, asbestos-protected bearings, and normalized castings.

Bul F1454 is issued by U. S. Electrical Motors, Inc., Dept. CP, Box 2058, Los Angeles 54, Calif. When inquiring specify CP 6365 on handy form, pages 2 and 3.

### Gage to measure thickness of coatings

Six-page folder describes theory and operation of portable gage used to measure thickness of non-magnetic coatings on magnetic bases. When equipped with accessory, instrument will reveal presence of pin-holes and scratches in non-conductive coatings on conductive bases. Notable application of gage is in examination of corrosion-protective coatings for thickness and film continuity. Publication describes procedure to follow when making examination and circuit diagram of unit is included. Unit is illustrated, and specifications are listed.

Coatingage folder is issued by Branson Instrument, Inc., Dept. CP, 430 Fairfield Ave., Stamford, Conn. When inquiring specify CP 6366 on handy form, pages 2 and 3.

### Batch cooking of liquids with burner clusters

Clusters of burner units mounted in cast refractory are described in 12-page bulletin. Processors of resins, varnishes, oils, inks, greases, chemical solutions, and other materials which are cooked in batch quantities will be interested in advantages and features of units as listed in pamphlet.

Nine separate advantages are tabulated and discussed. Features of individual burner units and cluster arrangements of individual units are listed. Line drawing and schematic diagram (in two colors) illustrate various types of mountings for cluster and combustion system. Eight photographs of industrial installations and types of material processed at locations pictured are included. Five varieties of related equipment for processing of liquids are shown.

Bul SC-1015 is issued by Selas Corporation of America, Dept. CP, Philadelphia 34, Pa. When inquiring specify CP 6367 on handy form, pages 2 and 3.

### Illustrated bulletin describes liquid-level controllers

Twelve-page, graphic bulletin discusses various types of liquid-level controllers. Specifications, features, ratings, dimensions, installation, and modifications are outlined for electric and pneumatic models. Numerous photos and drawings illustrate features and characteristics of units.

Bul 2503 is issued by Moore Products Co., Dept. CP, H and Lycoming Sts., Philadelphia 24, Pa. When inquiring specify CP 6368 on handy form, pages 2 and 3.

### Continuous-automatic method cleans dust from filters

Illustrated 16-page bulletin describes method of cleaning filter cloth in dust filter by means of high pressure reverse jet air. This method eliminates shutdowns for cleaning or rapping.

Advantages and construction details are outlined by charts, diagrams, and photos. Dimension charts, capacity ratings, and diagrams of specially engineered and installed layouts are included.

Bul 528 is issued by The Day Company, Dept. CP, 817 3rd Ave. N. E., Minneapolis 13, Minn. When inquiring specify CP 6369 on handy form, pages 2 and 3.

### Humorous booklet surveys company products

Thirty-two-page booklet gives slightly humorous and very informative review of organization and products of maker of processing equipment.

Following brief history of company, pumps, engines, compressors, air conditioning units, refrigeration units, steam turbines, steam condensers, heaters, construction equipment, industrial mixers, liquid meters, water treating systems, and other types of equipment are described. Numerous photos and cartoons are included.

Bul WP-1099 is issued by Worthington Corp., Dept. CP, Harrison, N. J. When inquiring specify CP 6370 on handy form, pages 2 and 3.

### Applications and specs of industrial hose

Twenty-four-page catalog describes and gives complete specifications of industrial hose assemblies, couplings, stems, swivels, and accessories. Hose is designed for intermediate and very high pressure, for ordinary and elevated temperatures, for excessive flexing and rough handling. Used for conveying oils, plastics, air and other fluids.

Photographs, line drawings, and tables illustrate and describe mounting, specifications, and features of equipment. Cat 52 is issued by J. N. Fauver Co., Dept. CP, 49 W. Hancock Ave., Detroit 1, Mich. When inquiring specify CP 6371 on handy form, pages 2 and 3.

### *Save time and labor with burner units*

Burner assemblies are easy to install and avoid time and labor for ramming tunnels of refractory mixtures. Twenty sizes of tunnel burner units for use with natural or artificial gas are tabulated according to capacities and dimensions in handy chart included in catalog.

Tunnel burner assemblies include sealed-in gas burner nozzle, flanged burner mounting box, and refractory tunnel block. Latter component replaces on-the-job fabrications using refractory mixtures and ramming process.

Sealed-in nozzles for use with rammed-in tunnels and equipment for supplying air-gas mixtures are described. Cat No. 807 is issued by Hauck Manufacturing Co., Dept. CP, 124-136 Tenth St., Brooklyn 15, N. Y. When inquiring specify CP 6372 on handy form, pages 2 and 3.

### *Modified alkyd resin formulations*

Revised bulletin contains four pages of technical data and suggested formulations for oil modified alkyd resin. Product was specifically designed for use in nitrocellulose furniture lacquers.

Brief review includes discussion and table of specifications and results of various climatological tests. Chart lists seven suggested formulations and summarizes results of physical tests on panels treated with these formulations. Several applications are indicated in brief list.

"Rezyl Resin 50-5" is issued by American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. When inquiring specify CP 6373 on handy form, pages 2 and 3.

### *Reviews information on butyl alcohol*

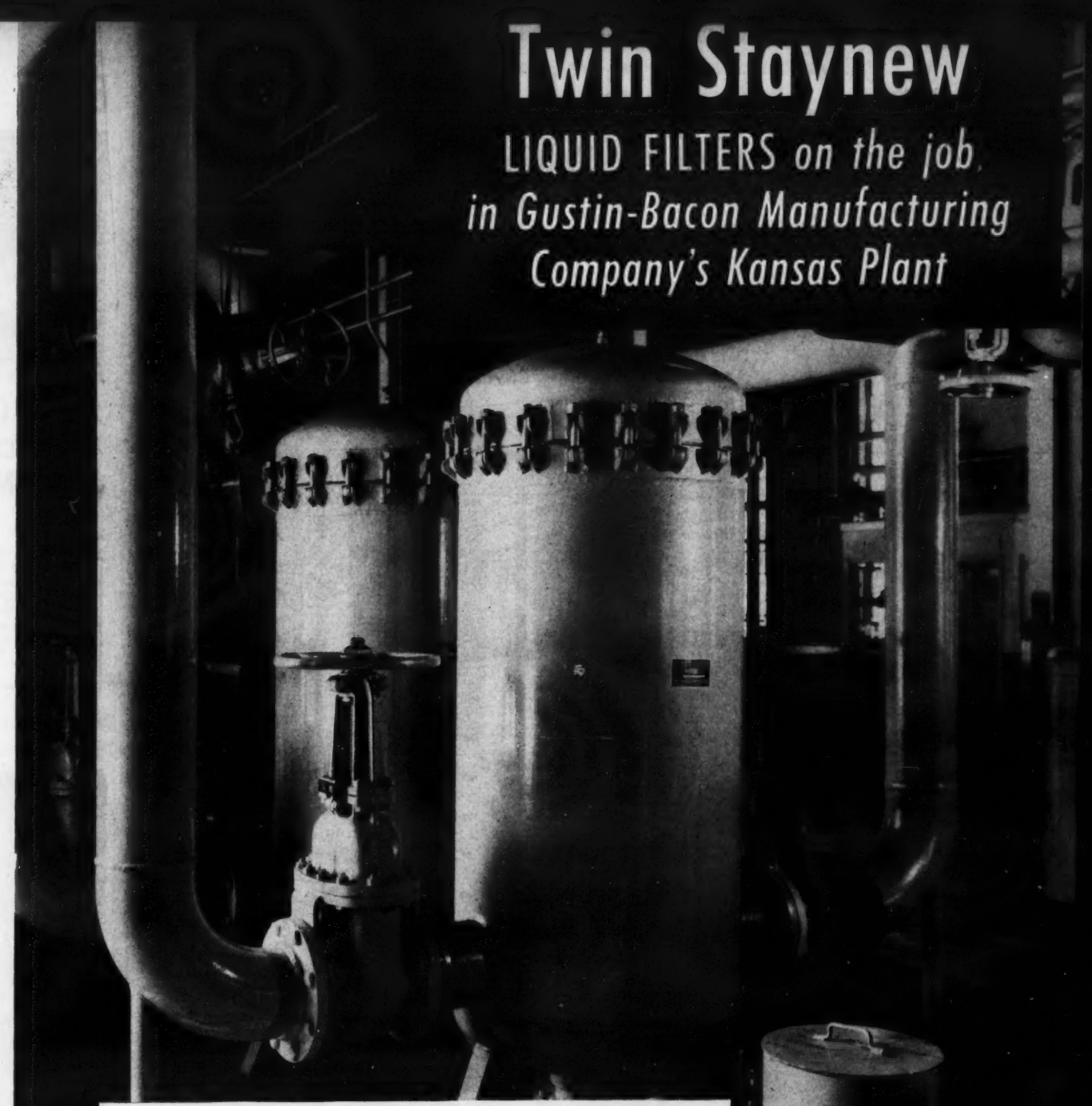
Two-page bulletin summarizes technical data on butanol, normal butyl alcohol. General information, specifications, physical properties, uses, toxicity, shipping, handling, and storage are discussed.

Bul TDS-9 is issued by Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. When inquiring check CP 6374 on handy form, pages 2 and 3.

**For more information on product at right, specify CP 6375 . . . see information request blank between pages 2-3.**


# Twin Staynew

## LIQUID FILTERS *on the job in Gustin-Bacon Manufacturing Company's Kansas Plant*



**Treated water used to cool transformers, busbars, bushings, and bushing terminals in the Gustin-Bacon Manufacturing Company's plant at Kansas City must be kept free of all foreign matter to insure uninterrupted around-the-clock operation.**

**Since the installation of these giant bronze fitted ELS Liquid Filters in the circulating cooling water system, down time due to cooling tube and orifice stoppage has been eliminated.**

DOLLINGER PROTECTS MOTOR STAYNEW FILTERS

DOLLINGER CORPORATION

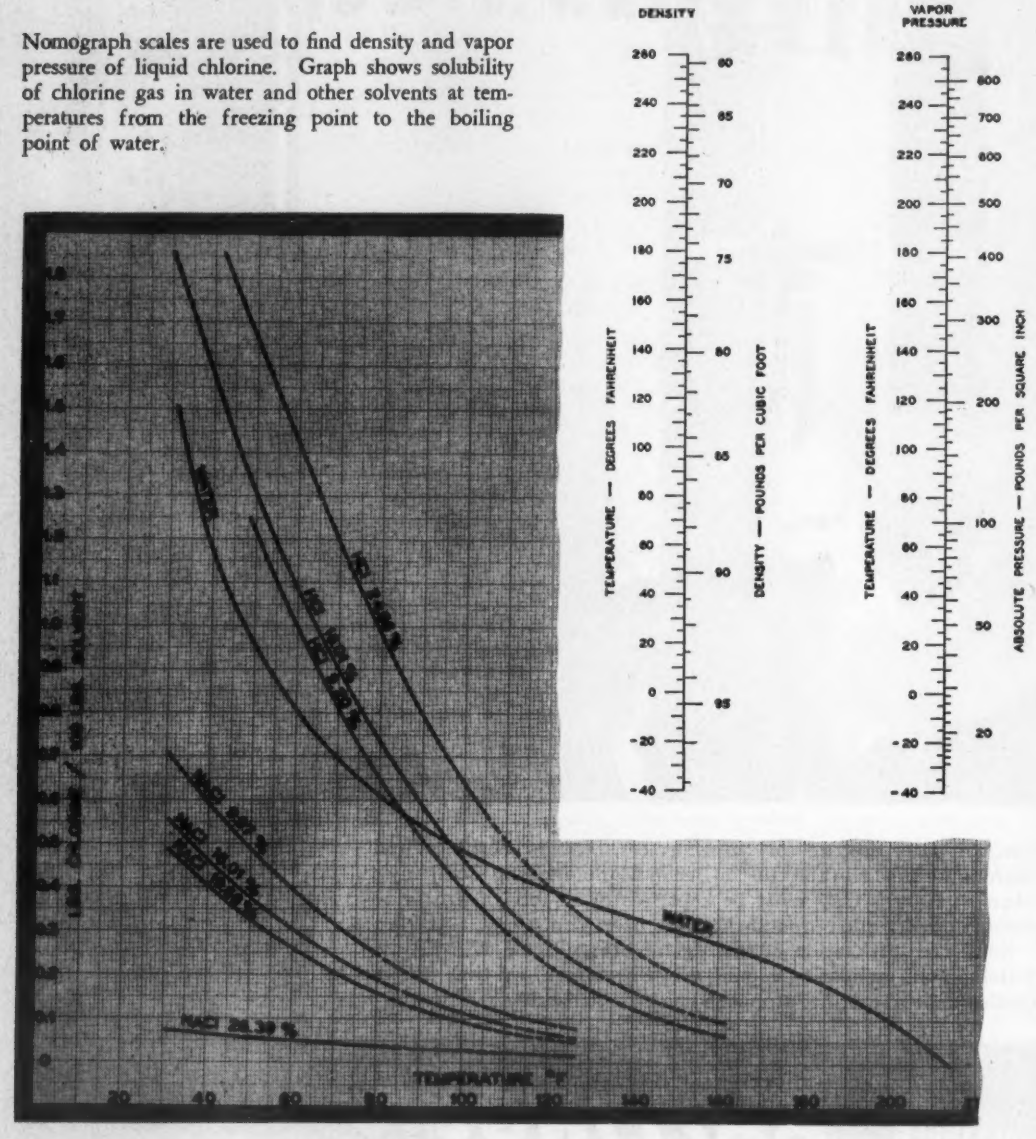
65 Centre Pk. Rochester 3, N. Y.

ALL TYPES OF FILTERS FOR EVERY INDUSTRIAL NEED

# CHLORINE DATA

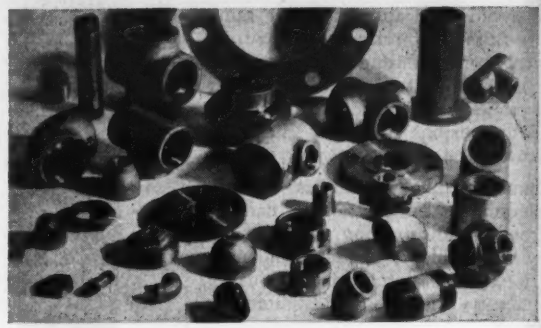
Data from the "Chlorine Handbook" published by Diamond Alkali Company, Cleveland 14, Ohio

Nomograph scales are used to find density and vapor pressure of liquid chlorine. Graph shows solubility of chlorine gas in water and other solvents at temperatures from the freezing point to the boiling point of water.





EVERY TYPE to fit every problem



INCO-CAST Fittings
CORROSION-RESISTING
Monel,® Nickel and Inconel®

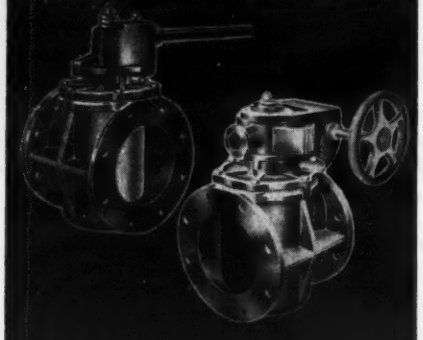
- Resist most corrosives
- Withstand high and sub-zero temperatures
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- Protect product purity
- Pressure-tested
- Economical in cost
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WRITE for handy price list catalog. Contains full information, and will be sent you promptly. No obligation.

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

When inquiring check CP 6376 on handy form, pgs. 2-3

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IS THE WORD FOR
DeZURIK
PLUG VALVES



Without Lubrication -- with just a smooth quarter-turn --- DeZurik valves open to full-flow or shut dead-tight every time in any service!

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Don't Leak, Don't Stick, Don't Gum Up!

A size and type for every chemical job

DeZURIK SHOWER COMPANY
Sartell, Minn.

When inquiring check CP 6377 on handy form, pgs. 2-3

### *Data on molded cups for hydraulic and pneumatic service*

Dimensions of molded cups for hydraulic service, pump pistons, and pneumatic equipment are presented in six-page folder. According to requirements, cups are constructed of cotton duck with rubber binder, leather, and rubber or synthetic rubber with fabric insertion. Information on particular service of various cups is tabulated in bulletin. Folder concludes with description and sectional illustrations of three types of tapered and straight rod ends of pistons designed for manufacturer's cups.

Bul AD-145 is issued by Garlock Packing Company, Dept. CP, Palmyra, N. Y. When inquiring specify CP 6378 on handy form, pages 2 and 3.

### *Guide to use of seamless mechanical tubing*

Four-page bulletin is designed to aid processor to determine whether he should use hot finished, cold drawn or "roto-rocked" seamless mechanical tubing as basis for his product. In addition to discussing use and machinability of tubing, publication outlines the differences in methods of production, surface finish, tolerances, and costs of tubing finished by three processes. Bul TB-340 is issued by Tubular Products Division, The Babcock & Wilcox Company, Dept. CP, Beaver Falls, Pa. When inquiring specify CP 6379 on handy form, pages 2 and 3.

### *Material handling accessories described in two bulletins*

Dual head unit for closing paper, cloth, or burlap bags after they have been filled is described in bulletin. Four photographs and accompanying text illustrate and describe how one sewing head is reloaded while other takes over to permit uninterrupted closing of bags as they come from filling machine. Unit also permits change-over from one bag type to another and continued operation during emergency servicing. Engineering drawings give space requirements and other dimensional details necessary for positioning unit in production line. Bul 5201 describes the sewing apparatus.

Bul 0152 contains similar information concerning sewing conveyor for handling filled bags and for use with the sewing apparatus.

Bulletins are issued by Richardson Scale Co., Dept. CP, Clifton, N. J. When inquiring specify CP 6380 on handy form, pages 2 and 3.

### *How to make proper choice of fork truck outlined*

Handy chart and descriptive procedure outlined in 8-page catalog makes possible proper selection of fork truck for any handling job. Complete choice of models is illustrated and described.

Photographs and charts show complete specifications on each product. Important construction and design features are graphically illustrated. Fork truck attachments are reviewed.

Fork and ram trucks, platform trucks, and crane trucks are reviewed in Cat 54 issued by The Baker-Raulang Co., Dept. CP, 1260 W. 80th St., Cleveland 2, Ohio. When inquiring specify CP 6381 on handy form, pages 2 and 3.





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**R.C.A. VICTOR** uses *ERIEZ* non-electric ATOMagnet Hump Separators in gravity flow lines to remove fine tramp iron from plastic powders used to make records. This avoids damage to dies and needles...eliminates down-time...saves money. The Hump can also be used in pneumatic or liquid flow lines.




**SAND HANDLING EQUIPMENT** at National Erie Corp. foundry is protected from dangerous tramp iron by an *ERIEZ* non-electric ATOMagnet Pulley. Made and installed in 4 days, this pulley replaced a burned-out electromagnet...improved performance...kept production rolling.




**WHY MAGNETIC PROTECTION IS IMPORTANT IN CHEMICAL PROCESSING!**

This is one of the subjects treated in a new bulletin offered by *ERIEZ* Manufacturing Company. It is complete with descriptions and installation drawings of all *ERIEZ* magnetic equipment for the chemical industry. If you are troubled with tramp iron, this brochure will tell you how to catch it and save money. Mail coupon today.

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When inquiring check CP 6382 on handy form, pgs. 2-3

# Establishing Safe Minimum Flow For Centrifugal Pumps

By E. C. CONDICT,
Application Engineer
De Laval Steam Turbine Company

PUMPING too little liquid through a centrifugal pump can result in the liquid flashing into vapor. This can happen because work done on the liquid causes it to heat. If quantity is great enough, heat is carried off by liquid stream. But below a minimum flow, temperature rises to the flash point. This minimum flow is termed *minimum continuous safe flow*, and the amount temperature can rise without flashing liquid into vapor is called *allowable temperature rise*.

Critical temperature (or allowable temperature rise) may be found by —

1) Determining net positive suction head in psi
2) Adding NPSH (in psi) to vapor pressure of the liquid at pumping temperature
3) Converting this sum of pressures to temperature by referring to vapor pressure curve for the liquid being pumped
4) Step three gives critical flashing temperature — difference between this and operating temperature is the allowable temperature rise

Minimum safe continuous flow may be calculated once allowable temperature rise has been found. First step is to find pump efficiency —

$$\eta = \frac{100\,(TDH)}{778t + TDH}$$

where:

$\eta$ = pump efficiency %
t = allowable temperature rise °F
TDH = total dynamic head feet

For calculating minimum safe flow, the greatest total dynamic head possible is used in the above expression. This is the shut-off pressure (SOP) as can be

(*Continued on page* 192)

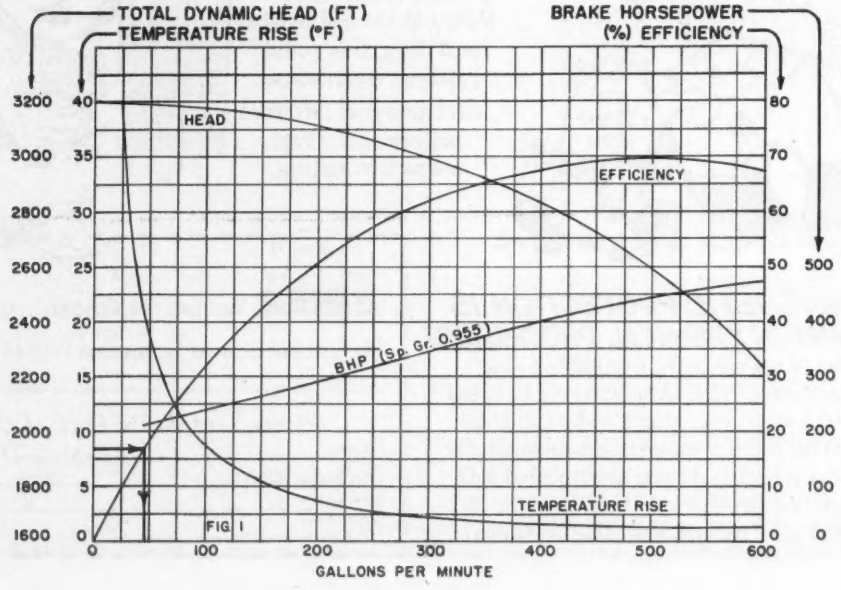
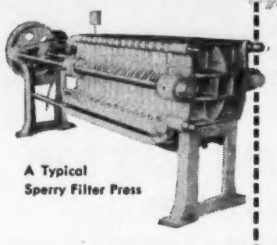



FIG. 1

with SPERRY FILTER PRESSES YOU GET ALL 3!



A Typical Sperry Filter Press

1. ECONOMY
Low first cost . . . low depreciation . . . economy in floor space and head room . . . minimum maintenance.

2. FLEXIBILITY
Handles the widest possible range of applications at maximum efficiency. Easily transported . . . erected.

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Most widely used type filter. Produces maximum clarity . . . driest cakes. Leak-proof construction. Delivers filtrate to higher level than filter.

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When inquiring check CP 6383 on handy form, pgs. 2-3

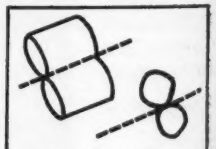
FOR FASTER, FINER GRINDS

BURUNDUM

Yes!! BURUNDUM gives you faster, finer grinds than conventional media, and here's why —

REASON ONE
BURUNDUM's unique, tubular shape.

REASON TWO
BURUNDUM's high specific gravity — 3.65. This high unit weight permits higher mill speeds—more contacts per minute—higher grinding consistencies.



Burundum's tubular shape means greater grinding contact area. No matter how the media falls contact area is greater than the pinpoint contact characteristic of spherical media.

REASON THREE
BURUNDUM's extreme hardness—9.0 on the Moh's Scale. This high hardness assures positive attrition and minimum wear of the medium.

TO GET MORE OUT OF YOUR MILLS, PUT BURUNDUM IN!

397-C
THE U. S. STONEWARE CO., AKRON 9, OHIO

When inquiring check CP 6384 on handy form, pgs. 2-3

### *Recorder uses phototube to gage turbidity of solution*

Two-page bulletin describes turbidity recorder which has total range of three parts per million on the silica scale. Instrument employs phototube to measure amount of light cut out by undissolved substances suspended in fluid. Publication discusses operating principles of instrument and its application to main line of processing or sampling. Recorder gives a continuous reading of variations in the sample. Sketches illustrate some of the various forms of sampling chambers, indicators, and recorders.

Bul 604 is issued by Ess Instrument Company, Dept. CP, Bergenfield, N. J. When inquiring specify CP 6385 on handy form, pages 2 and 3.

### *Automatic gage makes it easy to be "on the level" in readings*

"Varec" — an automatic, low-pressure type tank gage — is described in four-page leaflet. Specifications, description, and advantages are given for Varec Figure No. 2500 series of float-operated liquid level gaging equipment.

Cut-away and sectional diagrams illustrate construction and features of equipment. Auxiliary equipment for use with the series 2500 gage head is listed. Limit and controller switches as well as electronic remote reading gaging equipment are described. Schematic diagram shows a typical installation.

Bul CP-3500 is issued by The Vapor Recovery Systems Company, Dept. CP, Compton, Calif. When inquiring specify CP 6386 on handy form, pages 2 and 3.

### *Illustrated survey of facilities to fabricate metal products*

Manufacturer's equipment and apparatus to fabricate products in all metals of various gages, shapes and sizes are shown in 24-page bulletin. Pictorial survey of equipment shows welding, machining, galvanizing, metal spraying, and sheet or plate shop facilities which are available. Publication emphasizes technological "know how" of manufacturer's personnel in designing and producing accurate metal products. Several products are shown to illustrate variety of units which may be fabricated.

Bul 490 is issued by L. O. Koven & Brother, Inc., Dept. CP, 154 Ogden Ave., Jersey City 7, N. J. When inquiring specify CP 6387 on handy form, pages 2 and 3.

### *Halogen-sensitive leak detector for high vacuum systems*

Two-page data sheet outlines uses and operation of halogen-sensitive leak detector. In addition to listing specifications, publication discusses such factors as probing procedure, installation, and maintenance of leak detector. Unit is designed to maintain high vacuum systems (metallizing, furnaces, sintering systems, etc) at top operating efficiency. Manufacturer reports that instrument is capable of detecting one part of halogen in 100,000 parts of air as well as signalling presence of large leaks.

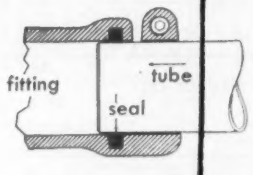
Data Sheet is issued by Distillation Products Industries, Div. of Eastman Kodak Co., Dept. CP, Rochester 3, N. Y. When inquiring specify CP 6388 on handy form, pages 2 and 3.




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stainless steel fitting
for joining pipe or tube
**without threading or welding**

**Quikupl**®




Designed to reduce assembly costs and to permit the use of less expensive lighter wall tubing. ***Quikupl*** stainless steel elbows, tees, couplings, reducers and adapters save you time, labor, materials and money.

***Quikupl*** means lower installation costs! No threading, welding, flaring or other skilled assembly operations. Just cut to length and deburr.

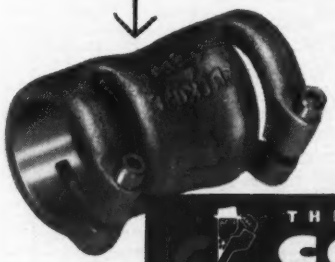
***Quikupl*** means lower material costs! Thin walled tubing can be used to maximum advantage.

***Quikupl*** means economical maintenance! Downtime is cut to a minimum. Assembly and disassembly become a matter of minutes.

***Quikupl*** means safe, leakproof connections! Synthetic sealing rings provide positive pressure-tight joints at all times.

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When inquiring check CP 6389 on handy form, pgs. 2-3

## Establishing Safe Minimum Flow for Centrifugal Pumps

(*Continued from page* 190)

seen in the Head curve in Figure 1. Thus —

$$\eta = \frac{100\ (SOP)}{778 + SOP}$$

When this efficiency has been found, it is used to find a corresponding capacity (using the Efficiency curve of the pump characteristic curves — Fig 1). This capacity is the minimum continuous safe flow.

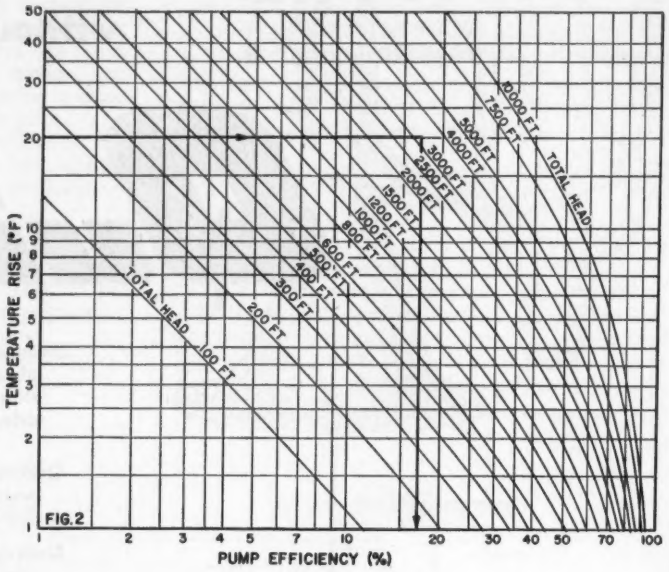
In the common case where liquid handled is hot water, families of curves have been drawn up to provide a graphic solution. Similar curves can be drawn for other liquids.

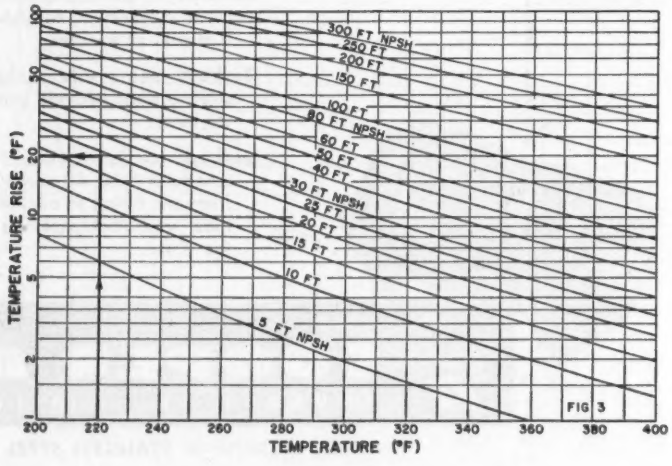
### Typical Example Using Graphic Method

Using the pump whose characteristics are shown and a shut-off pressure (head) of 3200 feet, what is the minimum continuous safe flow for water at 220°F if NPSH is 19 feet.

Start with Fig 3 — follow 220°F line to an interpolated value of NPSH of 19 feet. Corresponding temperature rise is seen to be 20°F. Now using the 20°F value in Fig 2, locate an interpolated value of 3200 feet of head and drop a vertical to read 17% efficiency. Returning to the pump characteristic curve (Fig 1), it can be seen that pump is 17% efficient at a quantity of 47 gpm. Thus 47 gpm is the minimum continuous safe flow.

In cases where flows smaller than the safe minimum are required, a bypass is frequently used. An orifice may be installed to permit only the minimum continuous safe flow in the bypass and either automatic or manual control may be installed for cutting out bypass at higher flows. *Bypass must not return to suction side of pump,* or liquid will be heated to flashing by repeated trips through pump.



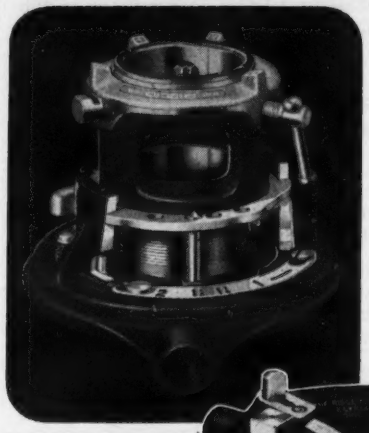





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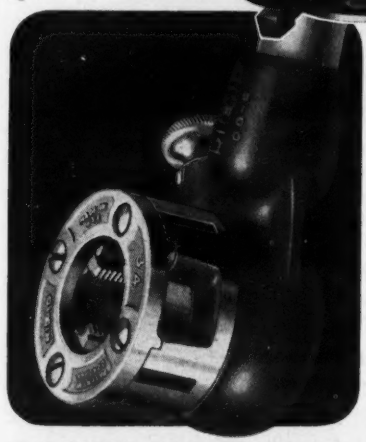
Work-Saver Die Stocks



**JAM-PROOF 65R** Perfect threads on 1" to 2" pipe with 1 set of 4 high-speed steel dies — sets to pipe size in 10 seconds. Lead screw on barrel won't jam on workholder—drive plate automatically kicks out driving pawl. Self-centering workholder sets instantly!



**4P GEARED THREADER** For 2½" to 4" pipe. Balanced loop handles—easy to lift 4P where you want it. Mistake-proof workholder sets to size before put on pipe—1 set screw. Safe enclosed gear. Practically no upkeep. Special 4P for conduit.



**00R RATCHETS** For ⅛" to 2" pipe. Heads snap into ratchet ring from either side, won't fall out. Precision-cut alloy dies reverse for close-to-wall threads. 00R and 0R, ⅛" to 1"; 111R and 11R, ⅛" to 1¼"; 12R, ⅛" to 2". Conduit dies, too.

**EXTRA VALUE** RIDGID's are famous for efficient design, smooth performance, rugged durability. Every die stock factory tested. For top value for your money, buy RIDGID threaders from your Supply House.

THE RIDGE TOOL COMPANY • ELYRIA, OHIO

RIDGID

Work-Saver Pipe Tools

When inquiring check CP 6390 on handy form, pgs. 2-3

### Proportions up to 57 gph from 1, 2 or 3 chambers

Sectional and schematic illustrations emphasize operating features of proportioning pumps, which are available with one, two, or three measuring chambers for capacities up to 57 gph. Eight-page bulletin also lists several chemical solutions, slurries, and viscous liquids which pumps can handle. General specifications are tabulated for the three models of proportioning pump. Bul 1225 is issued by %Proportioneers, Inc.%, Dept. CP, Providence 1, R. I. When inquiring specify CP 6391 on handy form, pages 2 and 3.

### Packaged unit to record and control fluid and gas pressures

Two-page data sheet presents technical information on combination potentiometer and electrical pressure transmitter. Unit is said to be particularly suitable for remotely recording pressures either by direct wire or by telemetering. General applications pertain to industrial processing where there is need to measure, record or control the pressure of fluid or gas. General electrical and mechanical specifications are given for instrument in addition to dimensional drawing of two types of pressure transmitter.

Data Sheet 10.2-5 is issued by Brown Instrument Division, Minneapolis-Honeywell Regulator Company, Dept. CP, Wayne and Windrim Ave., Philadelphia 44, Pa. When inquiring specify CP 6392 on handy form, pages 2 and 3.

### Flexible steel conduit has polyvinyl cover

Two-page bulletin describes machine tool conduit which is fabricated of galvanized steel and has polyvinyl plastic cover. Conduit is designed as armour to protect electrical wiring from oil, moisture, and other deteriorating conditions. It is available in sizes from 3/8 to 2" ID. Sectional illustrations show conduit installed and various connectors for straight and 90° angle installation. Bul CMH-108R is issued by Chicago Metal Hose Division, Flexonics Corporation, Dept. CP, 1319 S. Third Ave., Maywood, Ill. When inquiring specify CP 6393 on handy form, pages 2 and 3.

### Control operating temps over range of 700°F

Resistance elements and control units described in eight-page catalog offer control of operating temperatures over range from minus 100°F to plus 600°F. Equipment was designed for use in ovens, processing tanks of various types, injection molding machines, extruding machines, platen presses, stills, autoclaves, constant temperature baths, and incubators.

Specifications and features of temperature-sensitive resistance elements and controller units are outlined and illustrated with photographs, line drawings, and wiring diagrams. Advantages, operating principles, accuracy, sensitivity, installation, and maintenance of units are discussed. Brief resume of auxiliary equipment is included in catalog.

Cat section 55 is issued by Thermo Electric Co., Inc., Dept. CP, Fair Lawn, N. J. When inquiring specify CP 6394 on handy form, pages 2 and 3.





NOW A Standard Pump For Many Special Jobs!

SEE WHAT THIS PUMP can do before you order a costly "special purpose" chemical pump. It will do many of the jobs of a special pump, yet it costs hundreds of dollars less to buy.

It isn't meant to do every job in the chemical industry. But it will handle a big percentage of the jobs. Check the construction and design features that make this possible:

- It's built in most used ratings . . . to 1200 gpm, heads up to 250 ft.
- Handles liquids in most common temperature range . . . up to 550 F.
- Pumps liquors, corrosive materials and solutions, and petroleum products.
- Features double-row, oil lubricated bearings. Two oil rings running in generous reservoir of oil carry oil to bearings.
- Rigid cast iron pedestal supports pump body and holds bearings in alignment.
- Built in wide choice of materials including: iron, bronze, aluminum bronze, stainless steel, high nickel alloys and others.
- Large space for packing maintenance.

Get complete information. Call your nearby Allis-Chalmers authorized distributor or district office. Or write to Allis-Chalmers, Milwaukee 1, Wis.

A-3662

NEW PUMP FILMS



See new series of 3 sound-slide films, widely praised by educational and industrial groups. Get practical, instructive information on theory, application, installation and maintenance of centrifugal pumps. Series is designed for showing to maintenance meetings, plant groups, and engineering societies. Arrange now for a showing! Call your nearby Allis-Chalmers authorized distributor or district office. Or write Allis-Chalmers, Milwaukee 1, Wis.

ALLIS-CHALMERS

When inquiring check CP 6395 on handy form, pgs. 2-3

# Calculating Effect of Conditions on Free Energy of Gaseous Reactions

By GEORGE E. MAPSTONE

Edited by D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

A CHANGE in temperature or pressure can frequently render a polymolecular vapor-phase reaction more probable. Effect of pressure and temperature is given by —

$$\Delta F_p - \Delta F^\circ = -nRT \cdot \ln P$$

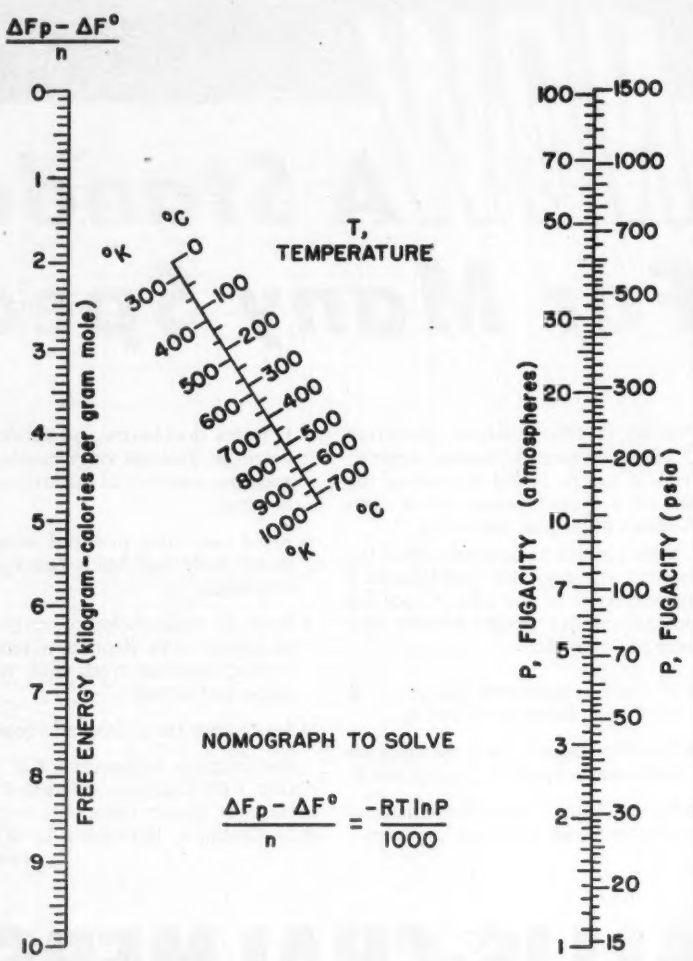
where:

- $\Delta F_p$ = free energy under reaction conditions
- $\Delta F^\circ$ = standard free energy
- P = fugacity in atmospheres (absolute pressure may be substituted for approximation)
- T = absolute reaction temperature, ° Kelvin
- n = decrease in number of molecules in the system per molecule of product formed

### Typical Example

Nomograph provides a convenient solution to the above equation. To find free energy, for instance, when temperature is 600°K and fugacity is 30 atmospheres, connect 30 on P scale with 600°K on T scale and read 4.0 kilogram-calories per gram mole on scale at left.

Procedure can be repeated for other conditions to establish free energy of the reaction so that preferred conditions can be found.




ALUMINUM MANUFACTURER* USES SWECO SEPARATORS with outstanding results



This particular installation was put in after the tower had been built... no super structure or reinforcing was required because SWECO Separators have no transmitted vibration.

One of the country's largest aluminum manufacturers is now using SWECO Separators both 48-inch and 18-inch sizes with one or more screen decks as required in several of their plants. At one plant, Calcined Alumina weighing 55 pounds per cubic foot, is handled by a Model A-1D 48″ SWECO Separator equipped with a 200-mesh screen with complete efficiency and amazing capacity. Aluminum dross is handled at the rate of over a ton per hour by a Model H-1D5 18″ SWECO Separator equipped with 40-mesh top and 80-mesh bottom screens. Both Standard and Custom-Engineered models available.

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8-3 SWECO

SEPARATOR DIVISION
SOUTHWESTERN ENGINEERING COMPANY
4800 Santa Fe Ave., Los Angeles 58, California

When inquiring check CP 6396 on handy form, pgs. 2-3

### *Aid to planning pipe and equipment layouts*

Four-page bulletin illustrates typical examples of fabricated fittings for 3 to 30" ID light-weight pipe. Four types of ell fittings are shown in bulletin, along with tee, cross, and lateral fittings. Special fittings may be fabricated from various steel alloys in range from 3 to 44" ID with wall thicknesses up to ¼ inch. Several of the special fittings are illustrated. Publication is intended as practical help in planning piping and equipment layouts. Bul 525 is issued by Naylor Pipe Company, Dept. CP, 1230 E. 92nd St., Chicago 19, Ill. When inquiring specify CP 6397 on handy form, pages 2 and 3.

### *Summarizes know-how for fireproofing textiles*

Review of number of studies into physical phenomena which occur when cellulosic materials are burned and processes by which various chemicals prevent this burning is included in 308-page report. Report gives detailed information on 3-year research project carried on at educational institution for a division of the armed forces.

Partial list of subjects includes thermal decomposition of cellulose and fire, pyrolysis and combustion rate studies on flame-proofed fabrics, chemical and physical properties of flameproofing agents, and exploratory investigations of flameproofing agents.

To obtain PB 111007, "Fundamental Studies of Chemical Retardants for the Fire Resistant Treatment of Textiles", remit $7.75 direct to the Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.

### *Gives speed reducer specifications for motor output of 12 - 330 rpm*

Detailed specifications on manufacturer's speed reducers (single and double reduction) where standard motors have output speed of 12-330 rpm, 1 to 43 hp, range are given in 16-page illustrated bulletin.

Featuring Torque-Arm speed reducers, the 8½ x 11" publication gives recommendations for V-belt drives on eleven different reducer models. Sample problem and handy factor tables are included for determining proper selection of speed reducer size.

Bul A-614-A is issued by Dodge Manufacturing Corp., Dept. CP, Mishawaka, Ind. When inquiring specify CP 6398 on handy form, pages 2 and 3.

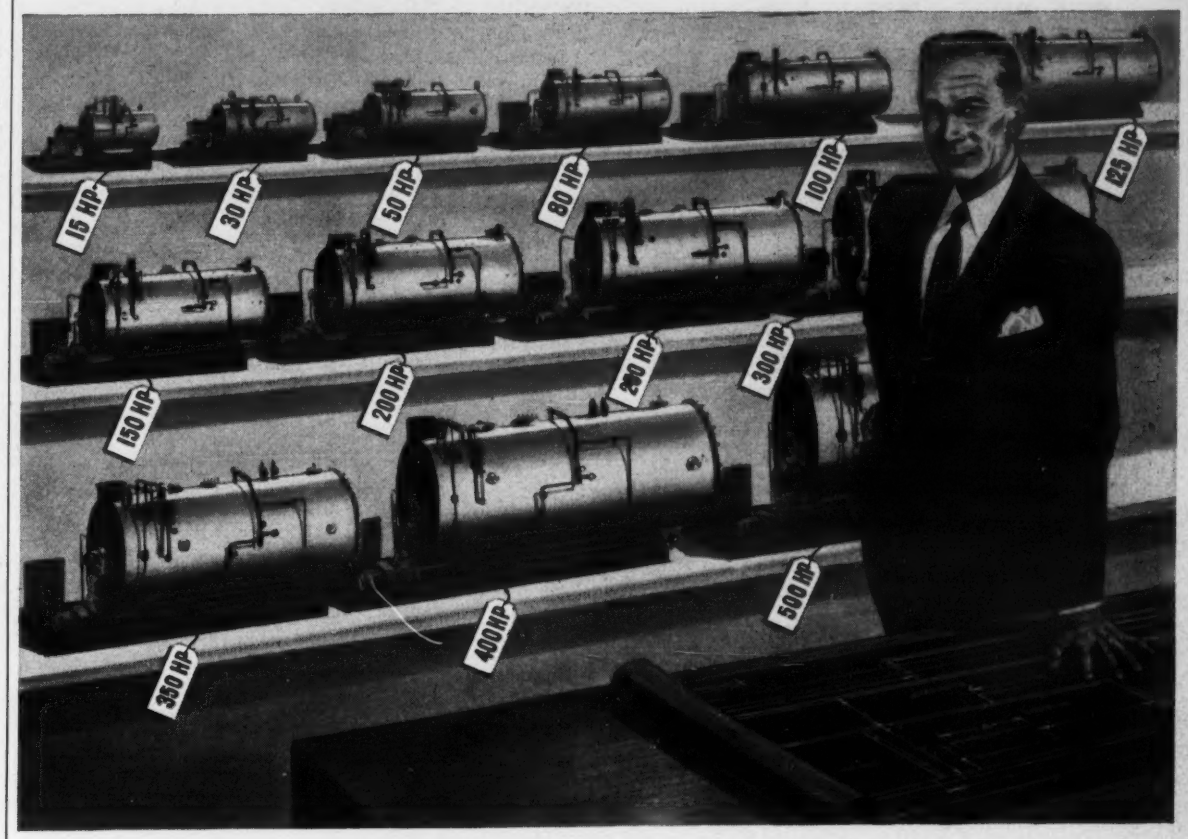
### *Graphic manual of information on lift truck operation*

Illustrated booklet outlines principles of safe and efficient lift truck operation. Twenty-three pages of material help experienced truck operators rate their knowledge and supplements study of beginners and trainees in order to help them become skilled operators.

Colorful block diagrams and line drawings aid in bringing to life basic principles of operation and safety. Unit loads, purpose of lift trucks, loading, pallets and patterns, and safety rules are described. Example of handy check list for preventive maintenance is included.

"How to Operate a Lift Truck" is issued by Hyster Co., Dept. CP, Portland 8, Ore. When inquiring specify CP 6399 on handy form, pages 2 and 3.


# Selecting The Right Boiler Is Most Important...



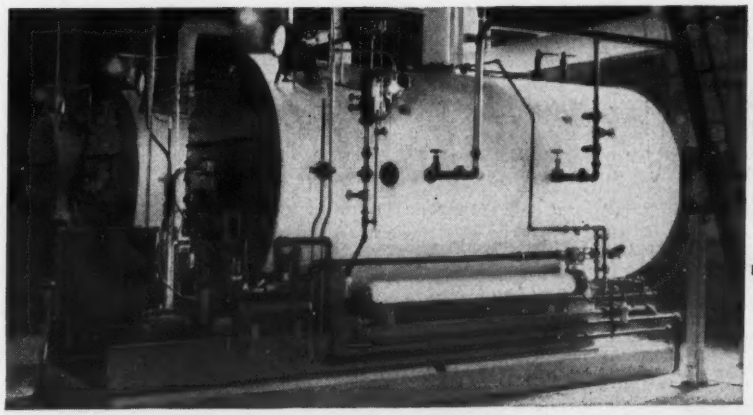

Cleaver-Brooks does not sell steam boilers "off the shelf" even though the boilers are available in standard models. Working with you, your engineers, and your consulting engineers Cleaver-Brooks helps analyze your particular steam needs and loads, both present and future.

These are a few of many factors considered: steam requirements in pounds per hour or b.h.p. — constant or fluctuating loads — fuels available — electric current characteristics — space and boiler room layout — provision for expansion.

Application engineering assistance of this kind assures you a steam plant tailored for your job. Cleaver-Brooks are the first and finest in modern, self-contained steam boilers — operate at a guaranteed efficiency of 80% — burn the fuel most available and economical in your area, gas, oil, or combination gas and oil — fully meet all codes — standard models available in sizes 15 to 500 hp; 15 to 200 p.s.i.

*Write for latest, fully illustrated and descriptive Cleaver-Brooks Steam Boiler catalog.*





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When inquiring check CP 6400 on handy form, pgs. 2-3

**BUFLOVAK-DOPP KETTLES**

***With Double Motion Agitators***

**SAVE Time and Production Costs**

**in Processing Heavy Viscous Materials**



2750-Gallon BUFLOVAK-DOPP Grease Kettle.

Investigate these BUFLOVAK Features for your processing problem:

- Thorough mixing, freedom from lumps and stratification . . . quickly and efficiently.
- No local overheating.
- Increase of heat transfer rates for rapid heating and cooling cycles.
- Easy and rapid discharge of material.
- Safe, quiet operation.
- Sturdy construction . . . dependable operation . . . low maintenance cost.
- Built in sizes from 1-gal. laboratory units to largest plant size kettles.
- Facilities available for pre-testing operation.

Write for complete information.

**BUFLOVAK EQUIPMENT DIVISION**

***of Blaw-Knox Company***

***1645 Fillmore Ave. Buffalo 11, N. Y.***

When inquiring check CP 6401 on handy form, pgs. 2-3



***Pumps offer range of heads, capacities up to 500 gpm***

Frame-type, centrifugal pumps described in 4-page bulletin are available in capacities up to 500 gpm and heads as high as 135 feet. Head and capacity can be changed by simply altering sheave size on V-belt drive.

Pumps can be mounted in variety of positions and connected to any type of prime mover without difficult alignment problems.

Cross section diagrams of three available types show features of construction. Performance curves are included in booklet. Bul 52B6691A is issued by Allis-Chalmers Manufacturing Co., Dept. CP, Milwaukee 1, Wis. When inquiring specify CP 6402 on handy form, pages 2 and 3.

***Specialty products fill specific lab needs***

Forty-two-page catalog lists seventeen products which fill specific needs in the chemical laboratory as well as in production. Stopcock lubricants, label varnish, cements, sealers, adhesives, cleaners, rust preventive oil, filter fabric, plastic paints, and other laboratory aids are described.

Cat 2 is issued by The Varniton Co., Dept. CP, 416 N. Varney St., Burbank, Calif. When inquiring specify CP 6402A on handy form, pages 2 and 3.

***Surveys principles, practices of various oven designs***

Twenty-two-page reprint describes and illustrates theory and operation of ovens and air heaters for industrial drying and finishing. Continuous conveyor type ovens and batch type ovens are discussed as well as importance of air recirculating systems and oven applications. Numerous photographs illustrate actual installations of equipment described in text.

"Drying and Finishing Ovens" is issued by Young Brothers Company, Dept. CP, 1931 Columbus Rd., Cleveland, Ohio. When inquiring specify CP 6403 on handy form, pages 2 and 3.

***Synthetic fiber may be dyed by using chemical carrier***

Procedures for using benzoic acid or salicylic acid in dyebaths for synthetic polyester fiber are described in technical bulletin. The two chemicals are used as carriers to promote absorption of dyes, a process which is normally a difficult one because of hydrophobic nature of the fiber.

"Carrier Dyeing of Dacron with Benzoic or Salicylic Acid" is issued by Heyden Chemical Corp., Dept. CP, 342 Madison Ave., New York 17, N. Y. When inquiring specify CP 6404 on handy form, pages 2 and 3.

***Rolls tubejoints to tightness-fit tolerance of less than 0.001"***

Four-page bulletin illustrates and describes tool which makes possible expansion and rolling of tubes into tubesheets by controlled method performed by automatic machine. Maker states that this procedure produces uniformly-tight tubejoints with tightness-fit tolerance of less than 0.001 inch.

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If you are responsible for processing operations in an administrative capacity as plant superintendent, chemical engineer, chemist, engineer or equivalent responsibility . . . in a plant of substantial operations* where chemical processing is an important factor . . . CHEMICAL PROCESSING . . . the magazine for MEN WHO MANAGE . . . will be sent to you without charge or obligation if you request it. Use form below. In requesting, be sure to answer all questions. If your firm is not rated or listed in standard references, indicate size of the company by capacity, annual sales or number of employees. Unless all information is given, magazine will not be sent.

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Drawings supplement detailed description of tool and its operation. Each step of procedure is described in detail. Features and advantages of tool are outlined.

Bul TX-50 is issued by Vernon Tool Co., Ltd., Dept. CP, 1101 Meridian Ave., Alhambra, Calif. When inquiring specify CP 6405 on handy form, pages 2 and 3.

### *All-electronic recorder gives true linear trace*

Two-color bulletin illustrates principles of operation and specifications of all-electronic recorder unit. Recording instrument is designed for use in chemical processing plants, refineries, central stations, and industrial plants.

Photographs and schematic diagrams show principles of operation. Individual sections deal with basic control system, electronic principle of operation, features, mechanical specifications, installation, set point, electrical specifications, operation, adjustments, and maintenance. Several dimensional sketches depict many of unit's features.

Bul A-704 is issued by The Swartwout Co., Dept. CP, 18511 Euclid Ave., Cleveland 12, Ohio. When inquiring specify CP 6406 on handy form, pages 2 and 3.

### *Tiny tubes, simple circuits are featured in pH meter*

Battery-operated pH meter uses only three radio batteries and subminiature tubes to greatly simplify electronic circuits for simple operation. Instrument can be supplied with stabilized power supply for operation on AC power line without batteries.

Two-page bulletin describes and illustrates features of unit. Bul 118 is issued by Photovolt Corp., Dept. CP, 95 Madison Ave., New York 16, N. Y. When inquiring specify CP 6407 on handy form, pages 2 and 3.

### *Condensers, heaters, coolers — in junior sizes*

Three basic types of condensers, heaters, and coolers in junior sizes are described in 4-page bulletin. They may be used in processing of chemicals, pharmaceuticals, gases, solvents, acids, caustics, vapors, oils, and other solutions.

Dimensional drawings and tables are used to show sizes and weights available. Operation, construction, and features are outlined.

Bul 800 is issued by Manning and Lewis Engineering Co., Dept. CP, 28-42 Ogden St., Newark 4, N. J. When inquiring specify CP 6408 on handy form, pages 2 and 3.

### *Equipment for chemical and ceramic labs*

Illustrated catalog presents survey of over fifteen types of chemical and ceramic laboratory apparatus. Specifications and uses are listed for each unit. Mixers, blenders, mills, filter presses, and pumps are described. Detailed information is included for jar mills.

Bul No. 77 is issued by International Clay Machinery, Inc., Dept. CP, Dayton 1, Ohio. When inquiring specify CP 6409 on handy form, pages 2 and 3.


FOR SUPERIOR Coatings

*Think first of the coatings that last!*

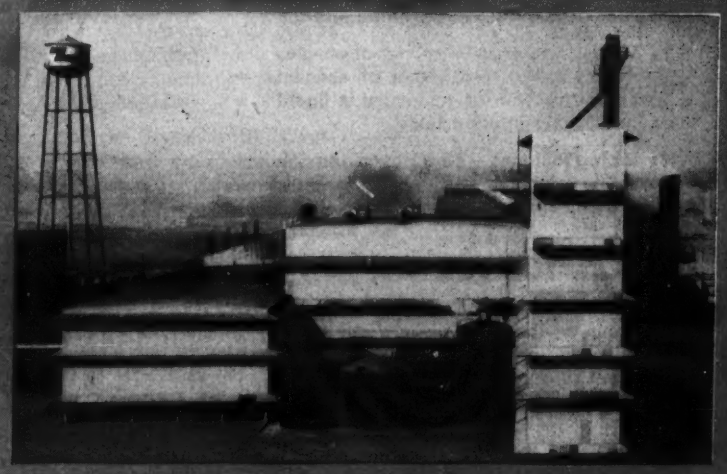
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Corrosive conditions in paper pulp mills and steel mills are terrific. The atmosphere in these plants is charged with acids and alkalis that eat the heart out of steel in a few years—or even a few months. INSUL-MASTIC *superior* COATINGS are giving protection that will last for years to this costly metal equipment in these extremely corrosive places.

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For long coating life under severe conditions specify INSUL-MASTIC *superior* Coatings.

**ST. REGIS PAPER CO., *by using Insul-Mastic Type "D", the Coating that Insulates and Protects,* will prevent up to 65% of heat loss from these black liquor tanks and foam tank. Many other vessels throughout this modern new mill at Pensacola, Florida are coated with Insul-Mastic for corrosion prevention as well as insulation.**



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When inquiring check CP 6410 on handy form, pgs. 2-3




**AGAIN WE STRESS THE TERM "TAILOR-MADE"...**

Because — NFM fabrics coupled with our cutting and sewing techniques result in made-up covers of low cost and high quality

**HOW CAN NFM FIT INTO YOUR PICTURE?**

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When inquiring check CP 6411 on handy form, pgs. 2-3


## NEW LITERATURE

### *Hydrogen and oxygen by electrolysis*

Pressure, bipolar-type, electrolytic cells for manufacture of hydrogen and oxygen by electrolysis are discussed in eight-page bulletin. Gases produced electrolytically are used for ammonia synthesis and oxidation, hydrogenation of coal, hydrogenation of oil and fat, manufacture of bulbs, gas torch and arc welding, and as protective gas for metallurgic processes.

Illustrations of installations, schematic drawing of one model, performance curve, and typical layout drawing are included. Table summarizes data for several types of "Electrolysers" with respect to hydrogen production, voltage and amperage requirements, and space requirements.

"The Bamag Electrolyser" is available from General Industrial Development Corp., Dept. CP, 270 Park Ave., New York 17, N. Y. When inquiring specify CP 6412 on handy form, pages 2 and 3.

### *Pictures activities in chemical field*

Complete word and picture story of industrial organization's activities in chemical field is given in 15-page booklet. Manufacturer and distributor of industrial chemicals, in addition to laboratory apparatus and chemicals, outlines products, operations, and facilities.

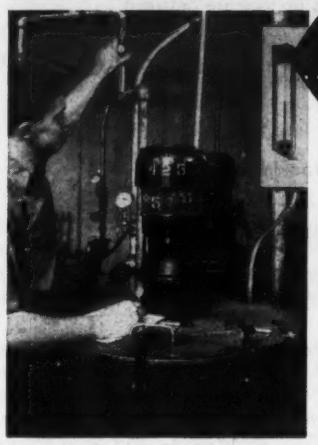
Booklet describes preformed catalysts, anodes and salts for electroplating, anhydrous hydrogen fluoride, fluorides, driers and metallic soaps, pigments, ceramic materials and chemicals, and synthetic optical crystals. Products and typical applications are listed in each section. Handy charts tabulate products and properties in several cases.

"Harshaw Chemicals for Industry and Laboratory" is issued by The Harshaw Chemical Company, Dept. CP, 1945 E. 97th St., Cleveland 6, Ohio. When inquiring specify CP 6413 on handy form, pages 2 and 3.

### *Surveys fundamentals of silicone fluids*

Over twenty different properties of silicone fluids, from boiling point to sound transmission, are thoroughly discussed and illustrated in 31-page booklet. Some properties included are freezing point, volatility, vapor pressure, stability, viscosity-temperature relation, shear resistance, oxida-


**For Faster, More Accurate MIXING and FORMULATING**



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In mixing or formulating of paints, oils, soaps, plastics—wherever liquids must be *weighed* or *measured*—King-Gages save time and trouble. Faster, more accurate than metering or stick measuring. Save cost of weigh tanks. Used with all types of tanks and vessels, open and closed. Quickly read, in any desired units of *volume* or *weight*. Located at the tank or for remote reading. Work as a frictionless balance; have no mechanical moving parts. *Investigate!*

*King-Gage here shows correct weight of thinners added direct from storage to closed mixing tank in paint room of major auto plant. Fast; safe; accurate.*

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SERVICE REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 6414 on handy form, pgs. 2-3




**FOR HIGH HEAD PRESSURE TO PROTECT YOUR PRODUCT**

Processing engineers are quick to acknowledge that there are many applications in pumping which require a positive displacement type pump for satisfactory results. One of these is in pumping against pressure.

Waukesha pumps overcome high pressure through positive displacement, not high speed. There's no aeration, churning or agitation which can be so damaging to the quality of your product . . . slippage and recirculation just doesn't happen with the positive displacement principle.

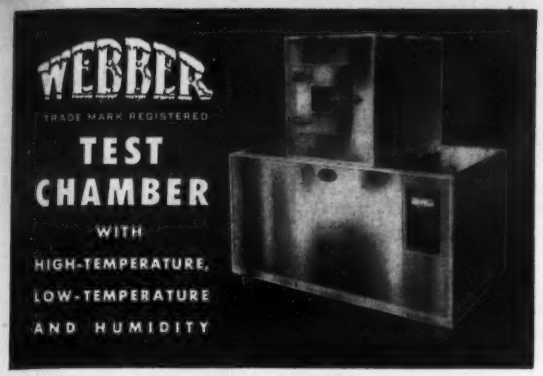
For high head pumping, Waukesha pumps assure proper transmission of your product, regardless of its viscosity. Protecting your product is the most important part of your entire processing operation.

Write for advice and details on the use of Waukesha Slow Speed Sanitary pumps for this purpose in your plant.

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WAUKESHA FOUNDRY CO.
WAUKESHA, WISCONSIN

Waukesha 100 SANITARY PUMPS
Dependable Product of a Responsible Manufacturer

When inquiring check CP 6415 on handy form, pgs. 2-3



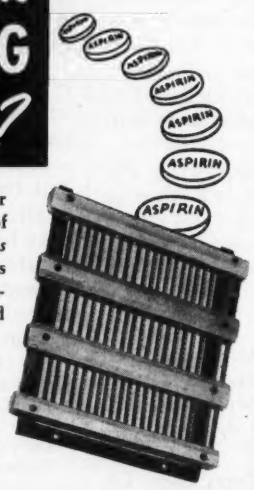

★ This Webber test unit, designed for production and experimental testing, has a temperature range from +250°F., to −100°F. The pull-down to −100°F., is achieved in 45 minutes, and can be cycled from −100°F., to +250°F., in 30 minutes. 95% relative humidity is provided at temperatures between 75°F., and 95°F. Vacuum equipment can be added to simulate high altitudes. The test chamber, provided with a moisture-proof light for illumination, is 4½ cubic feet, 20 inches high, 20 inches wide, 20 inches deep. High and low temperatures are governed by a temperature controller with scale range from −200°F., to +400°F., with a 3 degree control point differential, 1½ degrees plus and minus. The humidity is regulated by a wet and dry bulb controller. Unit size is 60" long, 45" wide, 74" high. Apertures in left side of cabinet provide for electrical cables to energize equipment being tested. Webber offers a complete line of test units for various applications.

*Write for more complete information*

INDUSTRIAL FREEZER DIVISION
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2740-E MADISON AVENUE • INDIANAPOLIS 3, INDIANA

When inquiring check CP 6416 on handy form, pgs. 2-3

*Have* YOU *a* HEATING *Headache?*




The Production Manager for a prominent manufacturer of Aspirin Tablets got rid of *his* by equipping the company's Conveyor Type Drying Machinery with TRENT Patented

**"Folded-and-Formed" Heating Elements**
***Long Life Guarantee!***

This installation is typical of the wide variety of applications for these efficient, economical electric heating elements . . . in Custombuilt or Standard Racks.

Write for complete information on "Folded-and-Formed" Heating Elements, or send details of *your* application.

TRENT INC
Electrically Heated Industrial Equipment
235 LEVERINGTON AVE PHILA 27 PA

When inquiring check CP 6417 on handy form, pgs. 2-3


## NEW LITERATURE

tion resistance, water repellency, dielectric characteristics, and solubility.

Numerous references to textbook data are given and a blending chart for intermediate viscosities is included.

The section on applications describes use of silicone as damping fluid, instrument fluid, hydraulic fluid, liquid dielectric, lubricant, release agent, water repellent treatment, polishing agent, coating and impregnant, and as an additive to paints and varnishes. Dozens of current industrial applications are pictured and described.

"Dow Corning 200 Fluids" is issued by Dow Corning Corporation, Dept. CP, Midland, Mich. When inquiring specify CP 6418 on handy form, pages 2 and 3.

### *Solenoid valves give leakproof control*

Complete line of solenoid valves which incorporate a sliding metal seal to give positive leakproof control are listed in 4-page catalog. Five different types—shut-off; 2-way diverter; 3-way selector; 4-way selector and 3-position, 4-way units—are included.

Valves have but one moving part; are not critical to dirt as constant contact between slide and seal prevents foreign material from lodging between sealing surfaces. Valves for air, water, and oil service come in three groups of pressure ranges — 0 to 250, 0 to 1500, and 0 to 3000 psi.

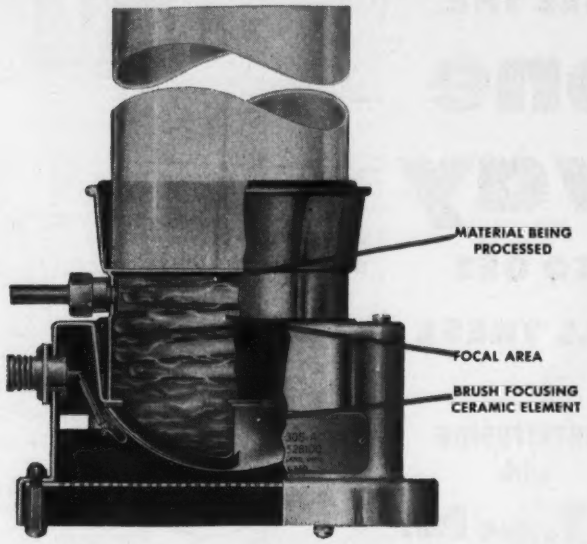
Eleven tables summarize specifications of various types of units. Cat 1B-2 is issued by Barksdale Valves, Dept. CP, 1566 E. Slauson Ave., Los Angeles 11, Calif. When inquiring specify CP 6419 on handy form, pages 2 and 3.

### *Describes welding of stainless steels*

Thirty-two-page booklet contains reprint of material from welding handbook dealing with welding of practically all types of stainless steels. Booklet covers welding of chromium-nickel steels, with and without molybdenum, as well as welding of straight chromium steel. Complete procedures are included. AWS-ASTM classifications of corrosion-resisting chromium and chromium-nickel steel welding electrodes (Specification A298-48T) are given.

Specifications are listed for several types of stainless steel electrodes. To obtain "Welding with Stainless Steel Electrodes" remit 25 cents direct to The Lincoln Electric Co., Dept. CP, Cleveland 17, Ohio.


# POWERFUL TOOL FOR YOUR ULTRASONIC RESEARCH

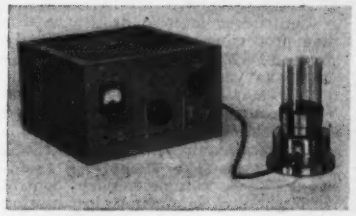



## Focusing effect of Brush Hypersonic Transducers provides high intensities

● Can ultrasonics help solve your processing problems? Now you can find out! With this Laboratory Transducer you can study the effects of acoustic intensities from 100 to 1000 watts per sq. cm. over a wide range of frequencies.

Heart of the HYPERSONIC Transducer is a unique piezoelectric ceramic element, which can be formed to focus energy at a point or a line. This permits a higher concentration of energy than is possible with any other transducer.

Use this powerful research tool to evaluate the use of ultrasonic energy in various processes in the chemical, biological, and industrial research fields. For complete information on HYPERSONIC Equipment, write the Brush Development Co., Dept. KK-41, 3405 Perkins Avenue, Cleveland, Ohio.



**APPLICATIONS**

**Published records describe successful application of ultrasonic energy to many fields. They show that it will—**

Emulsify oil-soluble and water-soluble liquids
Accelerate aging of alcoholic spirits
Stimulate destruction of bacteria
Clean small metal parts
Transform crystal structures
Vaporize liquids of all types
Degas liquids of various types
Emulsify mercury and water mixtures
Disperse metals in electrolysis production operations
Accelerate chemical reactions
Emulsify for smoother food products
Mix pigment and vehicle for paint
Homogenize milk and applicable liquids
Decompose gelatin or gum substances
Accelerate and stimulate germination of seeds
Disperse metallic elements in water, alcohol or oil
Produce stable photographic solutions
Oxidize water soluble dyes

PUT IT IN WRITING WITH A BRUSH RECORDING ANALYZER

THE *Brush* DEVELOPMENT COMPANY

BRUSH

Piezoelectric Crystals and Ceramics
Magnetic Recording
Acoustic Devices
Ultrasonics
Industrial & Research Instruments

When inquiring check CP 6420 on handy form, pgs. 2-3




**AGAIN WE STRESS THE TERM "TAILOR-MADE"...**

Because — NFM fabrics coupled with our cutting and sewing techniques result in made-up covers of low cost and high quality

**HOW CAN NFM FIT INTO YOUR PICTURE?**

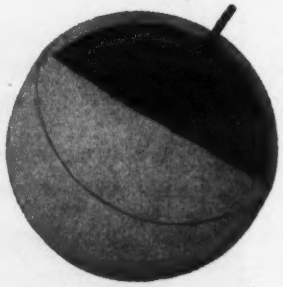
By relieving you of the need of maintaining inventories of roll cloth, of sewing threads

By offering you experienced labor at rates based on volume production of element covers for all types of equipment in liquid and pneumatic filtration fields

By our two factories — New Haven and Salt Lake City — located to give you maximum service and minimum delay in shipment

**WHAT CAN YOU DO?**

Order a trial quantity of made-up covers for your equipment. Compare our workmanship and price with your own figures. We feel sure you'll become another customer for our "Tailor-Made" products



*Weavers of Industrial Filter Media for over Forty Years*

NFM **The National Filter Media Corp.**

General Offices & Mills: New Haven 14, Conn.
Western Office & Factory: Salt Lake City 1, Utah

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| Chicago, Ill. | Cincinnati, Ohio | Houston, Texas | Oslo, Norway | Johannesburg, South Africa |
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| 2627 West 19th St. | Roselawn Center Bldg. | 1406 Second National Bank Bldg. | Nicolai Friis | Edward L. Bateman |

When inquiring check CP 6411 on handy form, pgs. 2-3


## NEW LITERATURE

### *Hydrogen and oxygen by electrolysis*

Pressure, bipolar-type, electrolytic cells for manufacture of hydrogen and oxygen by electrolysis are discussed in eight-page bulletin. Gases produced electrolytically are used for ammonia synthesis and oxidation, hydrogenation of coal, hydrogenation of oil and fat, manufacture of bulbs, gas torch and arc welding, and as protective gas for metallurgic processes.

Illustrations of installations, schematic drawing of one model, performance curve, and typical layout drawing are included. Table summarizes data for several types of "Electrolysers" with respect to hydrogen production, voltage and amperage requirements, and space requirements.

"The Bamag Electrolyser" is available from General Industrial Development Corp., Dept. CP, 270 Park Ave., New York 17, N. Y. When inquiring specify CP 6412 on handy form, pages 2 and 3.

### *Pictures activities in chemical field*

Complete word and picture story of industrial organization's activities in chemical field is given in 15-page booklet. Manufacturer and distributor of industrial chemicals, in addition to laboratory apparatus and chemicals, outlines products, operations, and facilities.

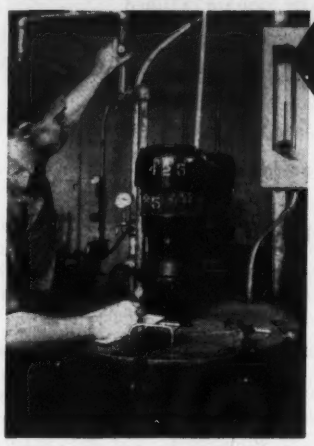
Booklet describes preformed catalysts, anodes and salts for electroplating, anhydrous hydrogen fluoride, fluorides, driers and metallic soaps, pigments, ceramic materials and chemicals, and synthetic optical crystals. Products and typical applications are listed in each section. Handy charts tabulate products and properties in several cases.

"Harshaw Chemicals for Industry and Laboratory" is issued by The Harshaw Chemical Company, Dept. CP, 1945 E. 97th St., Cleveland 6, Ohio. When inquiring specify CP 6413 on handy form, pages 2 and 3.

### *Surveys fundamentals of silicone fluids*

Over twenty different properties of silicone fluids, from boiling point to sound transmission, are thoroughly discussed and illustrated in 31-page booklet. Some properties included are freezing point, volatility, vapor pressure, stability, viscosity-temperature relation, shear resistance, oxida-


**For Faster, More Accurate MIXING and FORMULATING**



. . . the KING-GAGE

In mixing or formulating of paints, oils, soaps, plastics—wherever liquids must be *weighed* or *measured*—King-Gages save time and trouble. Faster, more accurate than metering or stick measuring. Save cost of weigh tanks. Used with all types of tanks and vessels, open and closed. Quickly read, in any desired units of *volume* or *weight*. Located at the tank or for remote reading. Work as a frictionless balance; have no mechanical moving parts. *Investigate!*

*King-Gage here shows correct weight of thinners added direct from storage to closed mixing tank in paint room of major auto plant. Fast; safe; accurate.*

FREE KING-GAGE BULLETIN gives full details; shows typical applications. Write for a copy.

KG INSTRUMENTS **KING ENGINEERING CORP.**
Box 50 • Ann Arbor, Mich.
SERVICE REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 6414 on handy form, pgs. 2-3




**FOR HIGH HEAD PRESSURE TO PROTECT YOUR PRODUCT**

Processing engineers are quick to acknowledge that there are many applications in pumping which require a positive displacement type pump for satisfactory results. One of these is in pumping against pressure.

Waukesha pumps overcome high pressure through positive displacement, not high speed. There's no aeration, churning or agitation which can be so damaging to the quality of your product . . . slippage and recirculation just doesn't happen with the positive displacement principle.

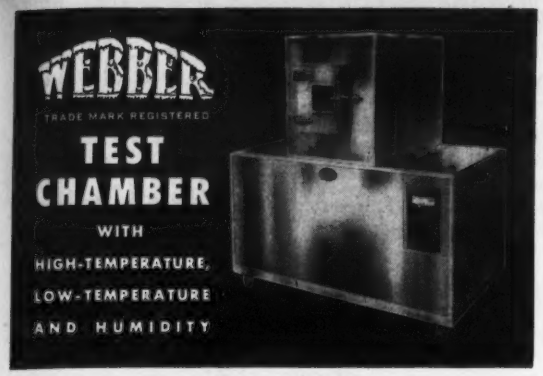
For high head pumping, Waukesha pumps assure proper transmission of your product, regardless of its viscosity. Protecting your product is the most important part of your entire processing operation.

Write for advice and details on the use of Waukesha Slow Speed Sanitary pumps for this purpose in your plant.

★ ★ ★
**WAUKESHA FOUNDRY CO.**
WAUKESHA, WISCONSIN

Waukesha 100 SANITARY PUMPS
Dependable Product of a Responsible Manufacturer

When inquiring check CP 6415 on handy form, pgs. 2-3



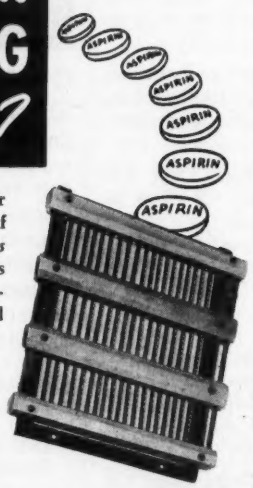

★ This Webber test unit, designed for production and experimental testing, has a temperature range from +250°F., to −100°F. The pull-down to −100°F., is achieved in 45 minutes, and can be cycled from −100°F., to +250°F., in 30 minutes. 95% relative humidity is provided at temperatures between 75°F., and 95°F. Vacuum equipment can be added to simulate high altitudes. The test chamber, provided with a moisture-proof light for illumination, is 4½ cubic feet, 20 inches high, 20 inches wide, 20 inches deep. High and low temperatures are governed by a temperature controller with scale range from −200°F., to +400°F., with a 3 degree control point differential, 1½ degrees plus and minus. The humidity is regulated by a wet and dry bulb controller. Unit size is 60″ long, 45″ wide, 74″ high. Apertures in left side of cabinet provide for electrical cables to energize equipment being tested. Webber offers a complete line of test units for various applications.

*Write for more complete information*

INDUSTRIAL FREEZER DIVISION
**WEBBER APPLIANCE CO., INC.**
2740-E MADISON AVENUE · INDIANAPOLIS 3, INDIANA

When inquiring check CP 6416 on handy form, pgs. 2-3

*Have* **YOU** *a* **HEATING** *Headache?*




The Production Manager for a prominent manufacturer of Aspirin Tablets got rid of *his* by equipping the company's Conveyor Type Drying Machinery with TRENT Patented

**"Folded-and-Formed" Heating Elements**
***Long Life Guarantee!***

This installation is typical of the wide variety of applications for these efficient, economical electric heating elements . . . in Custombuilt or Standard Racks.

Write for complete information on "Folded-and-Formed" Heating Elements, or send details of *your* application.

TRENT INC
Electrically Heated Industrial Equipment
235 LEVERINGTON AVE PHILA 27 PA

When inquiring check CP 6417 on handy form, pgs. 2-3


## NEW LITERATURE

tion resistance, water repellency, dielectric characteristics, and solubility.

Numerous references to textbook data are given and a blending chart for intermediate viscosities is included.

The section on applications describes use of silicone as damping fluid, instrument fluid, hydraulic fluid, liquid dielectric, lubricant, release agent, water repellent treatment, polishing agent, coating and impregnant, and as an additive to paints and varnishes. Dozens of current industrial applications are pictured and described.

"Dow Corning 200 Fluids" is issued by Dow Corning Corporation, Dept. CP, Midland, Mich. When inquiring specify CP 6418 on handy form, pages 2 and 3.

### *Solenoid valves give leakproof control*

Complete line of solenoid valves which incorporate a sliding metal seal to give positive leakproof control are listed in 4-page catalog. Five different types—shut-off; 2-way diverter; 3-way selector; 4-way selector and 3-position, 4-way units—are included.

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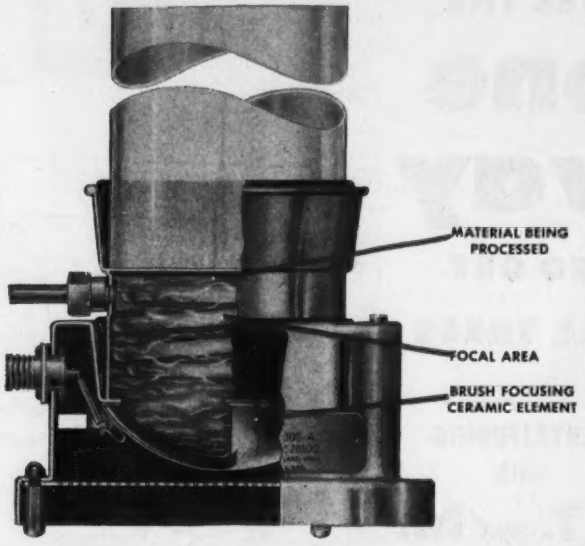
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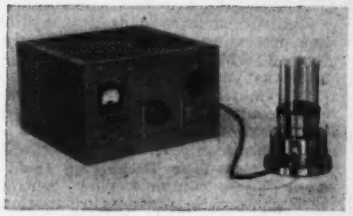



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**APPLICATIONS**

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Emulsify oil-soluble and water-soluble liquids
Accelerate aging of alcoholic spirits
Stimulate destruction of bacteria
Clean small metal parts
Transform crystal structures
Vaporize liquids of all types
Degas liquids of various types
Emulsify mercury and water mixtures
Disperse metals in electrolysis production operations
Accelerate chemical reactions
Emulsify for smoother food products
Mix pigment and vehicle for paint
Homogenize milk and applicable liquids
Decompose gelatin or gum substances
Accelerate and stimulate germination of seeds
Disperse metallic elements in water, alcohol or oil
Produce stable photographic solutions
Oxidize water soluble dyes

PUT IT IN WRITING WITH A BRUSH RECORDING ANALYZER

THE *Brush* DEVELOPMENT COMPANY

BRUSH

Piezoelectric Crystals and Ceramics
Magnetic Recording
Acoustic Devices
Ultrasonics
Industrial & Research Instruments

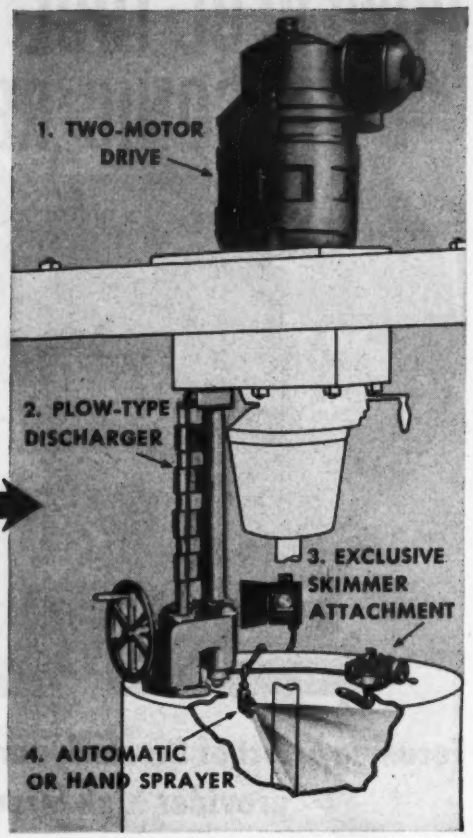
When inquiring check CP 6420 on handy form, pgs. 2-3

SEE THE

**one way**

TO GET

ALL THESE




CENTRIFUGING with

**A.T. and M.**

IS FASTER, CHEAPER MORE PRODUCTIVE

Centrifugal force leads the way to new processing efficiency . . . and only from AT&M do you get *all* the features that mean the greatest savings.

**Two-Motor Drive** provides a perfectly controlled fixed unloading speed with maximum safety. Its built-in oiling system requires no pumps or check valves. **Plow-Type Discharging Equipment** gives complete plow control throughout cycle, prevents lost motion and saves time with adjustable stops in every direction. **Exclusive Skimmer Attachment** removes surface liquid from solids, produces a drier cake, reduces aeration to a minimum. Trouble-free, compact, **Automatic or Hand Sprayer** measures amount of alcohol or water used for washing. Automatic sprayer functions at pre-determined time.

Investigate this modern method for separating, extracting, clarifying and other processing.



**TRY before you BUY**

Prove to yourself what efficiencies and savings can be gained in your processing. Send us a sample of your material for centrifuging to your specifications . . . or you can rent a laboratory AT&M at a very moderate rate. (Rental fees apply to ultimate purchase price.) Write for particulars.




**AMERICAN TOOL AND MACHINE COMPANY**
1412 Hyde Park Avenue, Boston 36, Mass.

Please send me my free copy of the new AT&M booklet "Centrifugal Force." I am interested in the following processes:

Separation ☐ Extraction ☐ Dehydration ☐ Clarification ☐ Coating ☐ Filtration ☐ Draining ☐ Thickening ☐ Impregnation ☐ Sedimentation ☐

SAVE TIME, SPACE AND COSTS WITH

**A.T. and M.** CENTRIFUGING

Name..... Title.....

Company.....

Street.....

City..... Zone..... State.....

When inquiring check CP 6421 on handy form, pgs. 2-3


## NEW LITERATURE

### *Silent chains for transmission of fractional horsepower*

Booklet describing silent chains for transmitting fractional horsepower at high or low speeds will interest designers and users of many types of machinery. Specifications and features of three basic types and seventeen standard widths of chains are included in this sixteen-page booklet.

Tables, engineering data, and instructions for correct selection of chain drives are given. Booklet includes photographs of typical applications. Drawings give dimensions of units.

Booklet 2510 is issued by Link-Belt Co., Dept. CP, Chicago 9, Ill. When inquiring specify CP 6422 on handy form, pages 2 and 3.

### *Photographs and line drawings of feeders and valves*

Equipment for handling various dry pulverized and granular materials is illustrated in 8-page bulletin. Roll, vane-type, and totally-enclosed feeders are described. Detailed photographs and numerous line drawings picture features and specifications of apparatus. Convenient tables summarize sizes, capacities, and other physical characteristics of units.

Bul F-4 is issued by Fuller Company, Dept. CP, Catasauqua, Pa. When inquiring specify CP 6423 on handy form, pages 2 and 3.

### *Illustrates design features of centrifugal compressors*

Illustrated, 12-page bulletin points out design features of complete line of centrifugal compressors. Single stage sizes — 30 to 600 hp — with pressures from 1-¼ to 3-¾ lb are described.

Functions, applications, ratings, arrangements and methods of control are covered. Design features are illustrated by use of exploded view of typical unit. Tables and charts summarize engineering data.

Bul 109 is issued by American Blower Corp., Dept. CP, Detroit 32, Mich. When inquiring specify CP 6424 on handy form, pages 2 and 3.

### *Surveys machine tools for every need*

Recent developments in machine tool field are described in 88-page catalog. Complete specifications and descriptions are given for entire line of lathes, shapers, and drill presses. Attachments, chucks, tools, and accessories are shown.

Cat 5205 is issued by South Bend Lathe Works, Dept. CP, 425 E. Madison St., South Bend 22, Ind. When inquiring specify CP 6425 on handy form, pages 2 and 3.

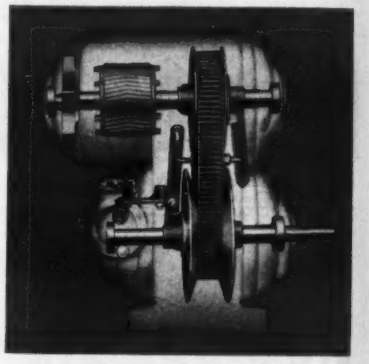
### *Applications and specifications for mixing equipment*

Uses and physical characteristics of various units of mixing equipment are described and illustrated in twelve-page bulletin. Applications and operation are described for each type of apparatus. Detailed lists of specific uses are included in some cases.


# Magnetic Separator Efficiency Improved With Speed-Trol

*Stearns Magnetic, Inc., of Milwaukee use Speed-Trols to drive their cross belt type magnetic separators for the beneficiation of such materials as wolframite, arsenic, pyrite, and monazite. Separation is based on varying degrees of magnetic response and Speed-Trols provide the accurate control of speed and wide speed range necessary to compensate for these variables and to achieve maximum separation of magnetic materials.*

STERLING SPEED-TROL



**OUTSTANDING FEATURES:**

Infinite speeds—positive speed regulation—fingertip control—large indicator—positive pulleys—no springs—belt tension in proportion to load—protected—streamlined—Herringbone Rotor—through ventilation—versatile mounting—NEMA dimensions—shock absorbing—quiet operation—rugged—compact—dependable—long life.

*70 ILLUSTRATIONS* showing how Sterling Electric Power Drives reduce production costs. Write for Bulletin No. B-121

**STERLING** ELECTRIC MOTORS

Plants: New York City 51; Van Wert, Ohio; Los Angeles 22; Hamilton, Canada; Santiago, Chile
Offices and distributors in all principal cities

When inquiring check CP 6426 on handy form, pgs. 2-3

Six types of turbine mixers and nine models of mixer drive heads are discussed. Chart summarizes dimensional data for large number of drive head models. Complete units, consisting of both tank and mixers, are described.

Bul No. 76 is issued by International Engineering, Inc., Dept. CP, Dayton, Ohio. When inquiring specify CP 6427 on handy form, pages 2 and 3.

### *Development of executive skills aim of integrated course*

Improvement of effectiveness of operating executives throughout business and industry is goal of management course outlined in 16-page booklet. Extensive and intensive program consists of thirty-six week schedule of management course units devoted to pertinent lectures, discussions, and distribution of reference materials.

Booklet includes brief resume of background and purpose of course. Comprehensive discussion of basic aims, facilities, type of instruction, lecturers, course materials, schedule, enrollment information, and features of course is given. Subject matter of various course units is decribed in detail. Long-range educational program is outlined.

"The AMA Management Course" is issued by American Management Association, Dept. CP, 330 W. 42nd St., New York 36, N. Y. When inquiring specify CP 6428 on handy form, pages 2 and 3.

### *Catalog features information on metal expansion joints*

Sixteen-page illustrated catalog contains convenient charts which tabulate specifications of redesigned line of metal expansion joints. Manufacturer states that joints offer increased traverse per corrugation. Several applications for product are included.

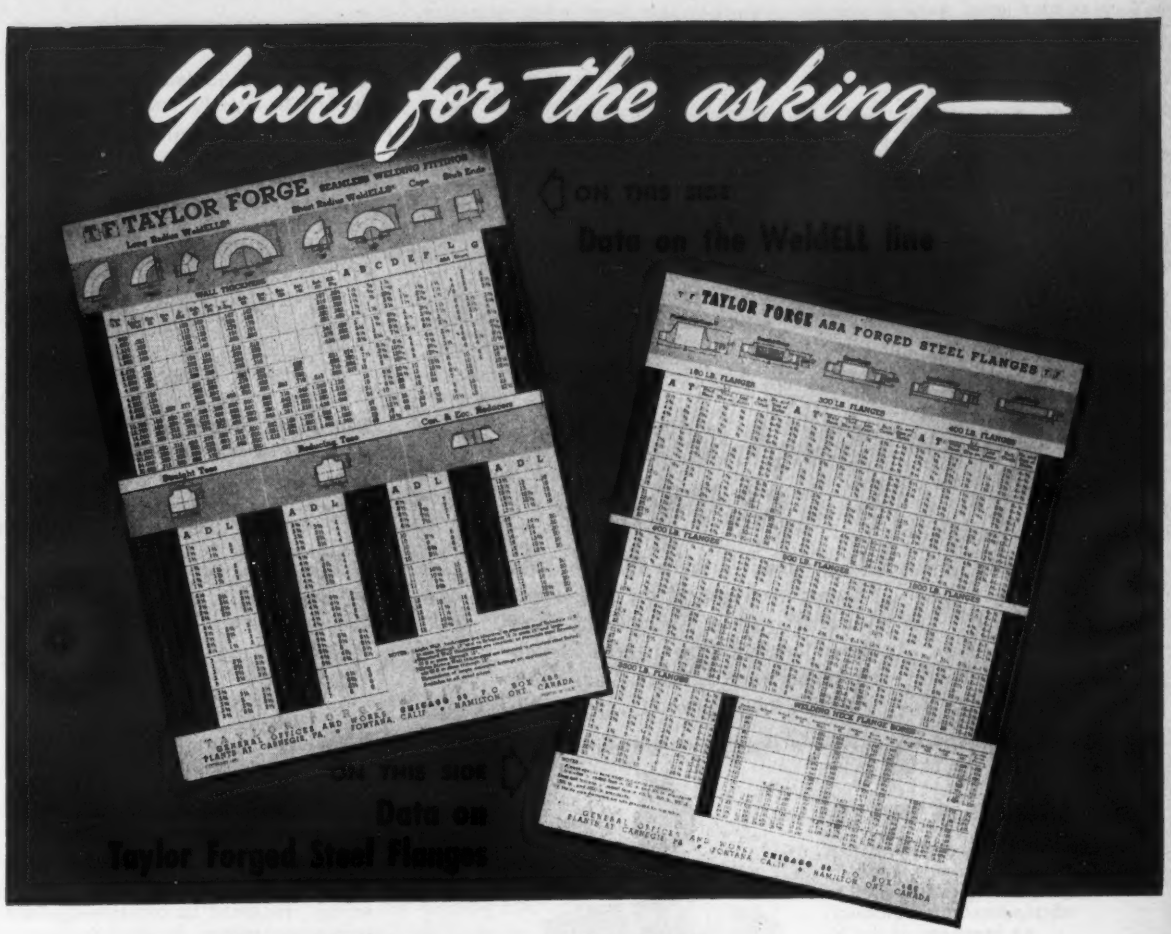
Application and specification information is outlined for corrugated and convoluted types of flexible metal hose, including couplings, flanges, nipples, and assemblies. Numerous cutaway views show construction and features of several of the products.

Additional information which aids in selection of proper product is contained in Cat CMH-128 issued by Flexonics Corp., Dept. CP, 1319 S. 3rd Ave., Maywood, Ill. When inquiring specify CP 6429 on handy form, pages 2 and 3.

### *Features of recording voltmeters and ammeters are shown*

Photographs and sectional illustrations are used in 28-page bulletin to emphasize design features of recording voltmeters and ammeters. In each case, the highlight is briefly described and indicated in photograph. In addition to single unit construction, instruments are characterized by high torque, low electrical burden, shockproof bearings, and accurate calibration.

Dimensions of instruments are shown in illustrations and essential specifications are listed. Bulletin also shows typical charts used in recording. Publication concludes with brief description of three types of transformer. Bul E1111 is issued by The Bristol Co., Dept. CP, Waterbury 20, Conn. When inquiring specify CP 6430 on handy form, pages 2 and 3.


**A VOLUME OF DATA**

**. . . covering welding fittings and forged steel flanges . . .**

**ON A SINGLE SHEET**

Here is just about the handiest tool ever devised for the pipe designer. Data on welding fittings and flanges that otherwise could be found only by plowing through many catalog pages and tables have been ingeniously condensed on the two sides of the durable letter-size card illustrated above.

One side covers the broad WeldELL line of Taylor Forge welding fittings. For every nominal pipe size, ½" through 30", it shows the wall thickness for every weight of every fitting in every available material. It also shows all required dimensions of all types of fittings.

The other side covers the world's most complete line of forged steel flanges. For every nominal pipe size, ½" through 24", it gives all essential dimensional and bolting data for all types of flanges in all weights. A particularly useful table (see reproduction) is that showing welding neck flange bores which enables you to determine the I.D. of any nominal pipe size without separate calculation. Thus the sheet gives you O.D. and I.D. of any weight of pipe.

The card is varnished to make it stand the steady usage you are certain to give it. To obtain your copy see your Taylor Forge distributor or **MAIL THE COUPON.**

TF

**TAYLOR FORGE**

TAYLOR FORGE & PIPE WORKS
General Offices and Works: P. O. Box 485, Chicago 90, Ill.
Offices in all principal cities.
Plants at: Carnegie, Pa.; Fontana, Calif.; Hamilton, Ont., Canada

Please send me one of your fitting and flange sheets!

NAME_____

POSITION_____

COMPANY_____

STREET ADDRESS_____

CITY_____ ZONE____ STATE_____

515-1152 Mail to Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill.

When inquiring check CP 6431 on handy form, pgs. 2-3

SPARKLER FILTERS · SPARKLER FILTERS

# Quality . . . Filtration

## SPARKLER FILTERS

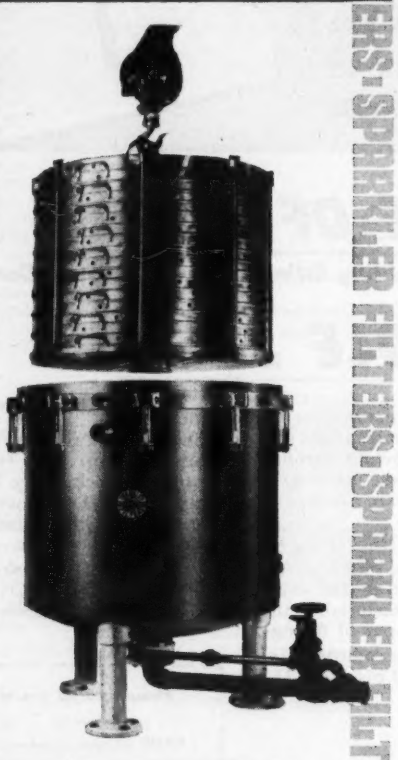
**High quality, sharp filtration has always been one of the prime features of Sparkler Filters. Many times Sparkler Filters have been chosen by experienced filtration engineers for this one point of superiority.**

## Here's why

**. . . any kind of filter paper, cloth, or screens, and any filter media can be used to obtain maximum efficiency.**
**. . . no breakage of the filtering surface even with intermittent operation as pressure is not required to hold cake in position on the horizontal plates.**
**. . . flow is always with gravity, down through the cake in a natural direction. The cake will not break, crack or slip because it is supported in a horizontal position and is not subject to tensile or distortive strain.**

**When you are looking for fine quality filtering, Sparkler Filters will do the job.**

**For personal engineering service write Mr. Eric Anderson.**



Makers of Filters for the Chemical, Pharmaceutical, Food and Petroleum Industries for over a quarter of a century.

**Sparkler representatives in all principal cities.**

**SPARKLER MANUFACTURING CO.**
**Mundelein, Illinois**
Sparkler International Ltd. Prinsengracht 876, Amsterdam, Holland
Sparkler Western Hemisphere Corp. Mundelein, Illinois, U.S.A.

SPARKLER FILTERS · SPARKLER FILTERS

When inquiring check CP 6432 on handy form, pgs. 2-3

## NEW LITERATURE

### *Upright and horizontal drives in 1/3 to 7½ hp range*

Sixteen-page bulletin describes Allspeed motor drives ranging from 1/3 to 7-½ hp. Both upright and horizontal drives of either closed or skeleton types are discussed. Pictorial series illustrates method of changing belts. Publication includes tabular material and discussion to simplify selection of proper drive. Bulletin concludes with dimensions and line drawings of various drives. Bul AS-1600-B6 is issued on letterhead request to Worthington Corporation, Dept. CP, Harrison, N. J.

### *Briefly describes the components of 2-sec speed potentiometer*

Individual members of two-second speed potentiometer are described in two-page specification sheet. Strip chart potentiometer is illustrated and drilling and mounting dimensions are shown in line drawing. Instrument operates on continuous balance principle. Pen and pointer of recorder will travel full scale in two seconds for 60 cycle operation.

Spec Sheet 179 is issued by Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Ave., Philadelphia 44, Pa. When inquiring specify CP 6433 on handy form, pages 2 and 3.

### *Catalog features lab items for many applications*

Eight-page catalog supplement tells features and uses of twenty-one items of laboratory equipment and accessories. Included in contents of booklet are mechanical convection ovens, constant temperature circulating system, portable pumps, glassware, laboratory carts, and many other items.

"Lanco Apparatus News" Vol 4 No. 2 is issued by Arthur S. LaPine and Co., Dept. CP, 6001 S. Knox Ave., Chicago 29, Ill. When inquiring specify CP 6434 on handy form, pages 2 and 3.

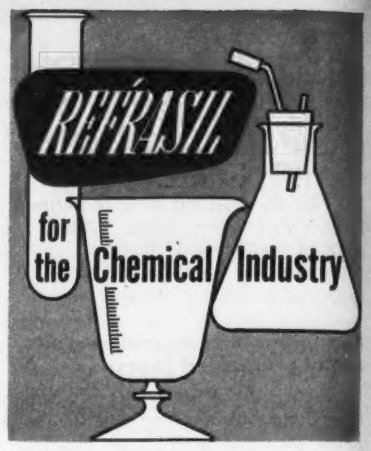
### *Removes dust from air without filters*

Bulletin surveys dust removal equipment and advantages of helical flow principle which eliminates use of any filter. Engineering data are presented to document claims and features of apparatus. Line drawings and cutaway views are used to illustrate specifications and construction.

Partial list of users and photographs indicate applications for units. Bul B-101 is issued by Dustex Corp., Dept. CP, 1758 Walden Ave., Buffalo 25, N. Y. When inquiring specify CP 6435 on handy form, pages 2 and 3.

### *Description surveys instrumentation in gas compressor stations*

Four-page data sheet provides general review of instument applications in gas compressor stations. Publication is intended to provide pipeline operators with current information as to the value of instrumentation in (1) automatic operation with all key variables under control




REFRASIL . . . widely used today in many industries has rapidly become an important filtration and insulation material for the Chemical Industry.

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When inquiring check CP 6436 on handy form, pgs. 2-3

and (2) efficient operation with minimum of maintenance or unsafe operating conditions.

Applications covered in discussion are gas flow measurement, gas pressure measurement, jacket cooling, water temperature control, telemetering of station variables, and combustible gas analysis. Data Sheet 7.2-3 is issued by Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Ave., Philadelphia 44, Pa. When inquiring specify CP 6437 on handy form, pages 2 and 3.

### *Parade of marking devices shows representative printings*

Automatic type marking machines for conveyor lines and manually operated machines are described and illustrated in 20-page bulletin. Equipment may be used to mark cartons, cans, multi-wall bags, and similar containers. Different types of marking machines are described according to respective uses, production, operation, construction, and similar characteristics.

Publication shows size and appearance of typical print types which are available with equipment. One section illustrates variety of type specimens for base-lock logotypes. Bul 2M-6/52 is issued by The Industrial Marking Equipment Co., Inc., Dept. CP, 454 Baltic St., Brooklyn 17, N. Y. When inquiring check CP 6438 on handy form, pages 2 and 3.

### *Oscillograph incorporates cathode-ray voltmeter*

Recently announced oscillograph features use of improved cathode-ray tube which permits accurate calibration system. This development allows unit to be used as an accurate, calibrated cathode-ray voltmeter.

Features of design and details of operation of unit are described in 12-page bulletin. Enlarged photograph of control panel illustrates each individual adjustment which is outlined in accompanying text. Complete procedure for calibration is discussed.

Complete specifications for components and adjustments are listed. Bul A-04-A is issued by Allen B. Du Mont Laboratories, Inc., 1500 Main Avenue, Clifton, New Jersey. When inquiring specify CP 6439 on handy form, pages 2 and 3.

### *Bleaching and stripping agent cuts loss of fabric strength*

A bleaching and stripping agent which in a 1 to 1½% solution strips colors with minimum loss of tensile strength is described in 4-page bulletin. Comparative tests with sodium hypochlorite and calcium hypochlorite are illustrated. Maker reports that even over-dosing with agent under normal conditions of use will not result in tenderizing of the fabric. Complete instructions for use as bleaching or stripping agent are included, as well as suggestions for use in treating process waters or in decreasing BOD of wastes.

"Clorpactin CXW for Bleaching and Color Stripping" is issued on letterhead request to Guardian Chemical Corp., Department CP, 10-15 43rd Avenue, Long Island City, New York.



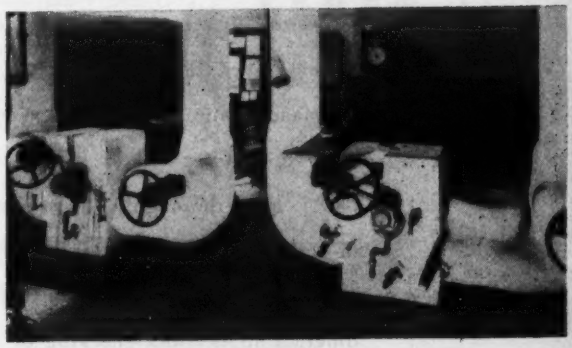

*New Plant of White Laboratories, Inc., Kenilworth, N. J. A. M. Kinney, Inc., Architect-Engineers, of Cincinnati, Ohio; Frank Brisco, General Contractor; Frank A. McBride Co., Mechanical Contractors.*

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"Buffalo" PUMPS

Whatever your operation, air conditioning is a "must" for keeping employees comfortable and product quality up. And air conditioning requires efficient pumps for circulating chilled water, as the two "Buffalo" Double Suction Pumps are doing below, in the new White Laboratories plant. Here, clean, conditioned air is circulated through "breathing walls" (made up of innumerable tiny holes), a unique application assuring the highest quality in the pharmaceuticals produced by White. It's the first installation of its kind.

Be sure of the pumps *you* use for handling clear water or chemicals. Specify "Buffalo", the complete line of centrifugal pumps used by leading industries for every liquid handling job. Why not write us *today* for information on the pumping application *you* are planning?



"Buffalo" insulated Type "SL" Double Suction Pumps on Chilled Water Service in the new White Laboratories plant. WRITE FOR BULLETIN 955-P, which describes these pumps.

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A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

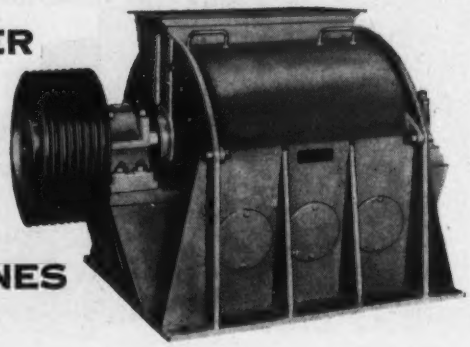
When inquiring check CP 6440 on handy form, pgs. 2-3

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All knife cutters are *not* alike. And you won't know how versatile a knife cutter can be until you learn about the unique Sprout-Waldron Knife Cutter. It screens after each cutting, thus reducing fines. It saves horsepower, eliminates vibration, and minimizes friction. It does things no other knife cutter will do . . . does them faster, more thoroughly and economically. At Sprout-Waldron you will find a world of experience in *adaptioneering* the knife cutter to many different applications—flocking of alpha pulp, granulating of plastics and grinding of rubber, to name a few. For full details, write to Sprout-Waldron & Co., Inc., 10 Logan Street, Muncy, Pennsylvania.

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When inquiring check CP 6441 on handy form, pgs. 2-3


## NEW LITERATURE

### *Points to varied features of direct-fired heater*

Eight-page bulletin uses cutaway illustration of typical direct-fired heater to show notable features of unit. Heaters operate automatically and are controlled by thermostat. Heat output ranges from 100,000 to 2,000,000 Btu/hr for six models referred to in publication.

Ventilation is arranged so that blower does not blast cold air during warm-up, but cuts in only when hot air is available. Discussion covers suspended and portable units, as well as typical installations. Bulletin concludes with line drawings of six models and general specifications for those heaters.

Bul GNC-10-52 is issued by Prat-Daniel Corp., Dept. CP, South Norwalk, Conn. When inquiring specify CP 6442 on handy form, pages 2 & 3.

### *Holders streamline bag filling*

Two-color, six-page bulletin covers four different types of bag holders. These holders secure bags to hopper outlets during filling.

Nine photos and text give operating details and recommended applications for clamp, inflated-ring, cable, and cam grip types of holders. High-speed filling operations, filling different sizes and types of bags, handling of toxic materials, filling from various sized spouts, and other bag holding information are included.

Both manual and air-operated bag holders are described and illustrated. Engineering drawings and specification tables give dimensions, installation data, and utility requirements of air-operated types.

Bul 0452 is issued by Richardson Scale Co., Dept. CP, Clifton, N. J. When inquiring specify CP 6443 on handy form, pages 2 and 3.

### *Shows filters, fillers and mixers*

Wide selection of filters, fillers, mixers, and pumps for handling of liquids is shown in 15-page illustrated catalog.

Filters described include asbestos disk, hard rubber, laboratory filters, and pyrogen filters. Asbestos filter sheets (coarse, medium, fine, and ultra-fine) are described with model numbers in regard to their specific applications.

Features of vacuum bottle fillers, both standard and portable models, are outlined. Direct drive and back


# *If a* TRUCK DRYER *is Suitable for Your Product...*




**Send for a copy of this illustrated booklet. It describes the various styles of dryers and trucks, and the "National" formula for securing maximum speed, efficiency and economy in all drying operations.**

**"National" Truck Dryers are being used successfully for chemicals, pharmaceuticals, ceramics, cosmetics, minerals, yarn, rayon cakes, tobacco, a variety of food products and small metal or mechanical parts. They are designed for either batch or continuous drying, with various methods of air circulation. Patented "Add-a-Unit" construction facilitates installation and provides for economical future expansion. The booklet gives complete details.**

Chemical Dryers of All Types and Sizes — NATIONAL — Special Drying and Heating Equipment

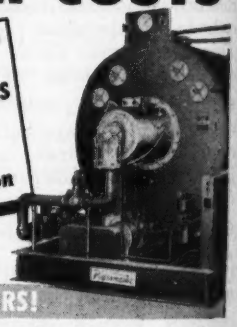
**THE NATIONAL DRYING MACHINERY CO.**

**2709 N. Hancock Street, Philadelphia 33, Pa.**

When inquiring check CP 6444 on handy form, pgs. 2-3

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SAVE FUEL and MAN-HOURS!

Thousands of Powermaster users are now getting top efficiency and low-cost steam or hot water for processing and heat after replacing out-of-date boilers with this modern, fully automatic, "packaged" steam generator.

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15 to 500 HP—FOR HOT WATER AND FOR STEAM UP TO 250 P.S.I.—for light oil, heavy oil, gas and combination gas/oil firing. Built to A.S.M.E. specifications and approved by Underwriters' Laboratories.

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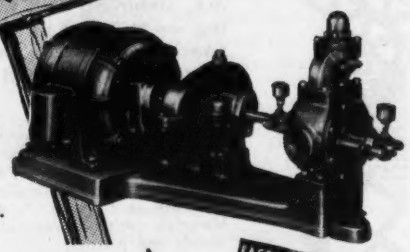
960 Morgantown Rd. Reading, Pa.

When inquiring check CP 6445 on handy form, pgs. 2-3

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THE PUMPS THAT ARE SELF-ADJUSTING FOR WEAR

The self-adjusting design maintains full pumping capacity even after years of severe service.



WHEREVER LIQUIDS ARE HANDLED

Capacities 5 to 1500 G.P.M.

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*Blackmer Pumps*

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Grand Rapids 9, Michigan

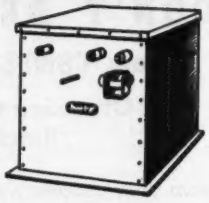



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When inquiring check CP 6446 on handy form, pgs. 2-3

*HIGH CAPACITY LIQUID COOLERS BY* **heat-x**

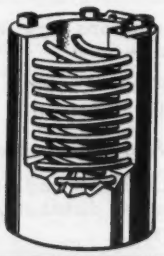




Refrigerant and liquid in separate tubes cast within an aluminum block mean a sanitary, trouble-free cooler . . . ready to connect to compressor.

For coolant, resistance welding and mold cooling . . . plating, anodizing and quenching baths. Also water cooling applications such as circulating systems, photographic units, etc.

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THE HEAT-X-CHANGER CO., INC.

BREWSTER • NEW YORK

When inquiring check CP 6447 on handy form, pgs. 2-3




geared swivel joint mixers and hand capper are briefly described. Last two pages are given to description of manufacturer's centrifugal pumps and self-priming pumps.

Cat 52 is issued by Ertel Engineering Corp., Dept. CP, Kingston 8, N. Y. When inquiring specify CP 6448 on handy form, pages 2 and 3.

### *Compress air or gas free of oil*

Manufacturer claims that compressor units described in four-page bulletin will compress air or gas entirely free of oil or oily vapors due to lubrication of any parts housed within main frame of units.

Equipment features use of steel-backed carbon cylinder-liner. Life-expectancy of units is said to be improved by this means.

Sectional view of typical unit illustrates component parts and features. Elements of design are outlined. Bul 600 is issued by Pennsylvania Pump and Compressor Co., Dept. CP, Easton, Pa. When inquiring specify CP 6449 on handy form, pages 2 & 3.

### *Characteristics, uses of natural rubber*

Characteristics and applications of a special form of natural rubber made in Malaya are described in 4-page bulletin. Special process used in manufacture preserves the crystal structure of the rubber and adds additional qualities.

Numerous photos illustrate typical uses of the product. Comprehensive list suggests numerous applications.

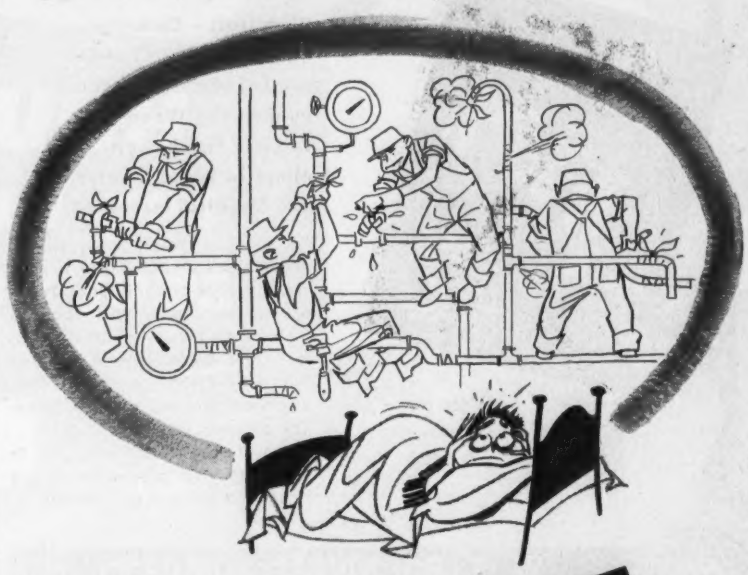
Bul L-101 is issued by Linatex Corporation of America, Dept. CP, Rockville, Conn. When inquiring specify CP 6450 on handy form, pages 2 & 3.

### *Shows pallet dollies for all operations*

Four-page bulletin illustrates and reviews four types of pallet dollies. Applications listed include fork truck and railroad car operation, and operation on rough or slotted floors. Maker reports 360° maneuverability in the latter operation. Photos and drawings indicate features and dimensions. Brief resume is given of industrial wheels and casters.

Bul 310-40 is issued by Roll-Rite Corp., Dept. CP, 801 Jefferson St., Oakland 7, Calif. When inquiring specify CP 6451 on handy form, pages 2 and 3.


*Say goodbye to nightmares about pipe repairs and replacements!*



**Install corrosion-resistant saran lined steel pipe wherever you are piping chemicals and solvents. Because saran is extremely resistant to most chemicals and solvents, such installations will give dependable, long-term service and reduce shut-downs due to pipe repairs and replacements. In addition to minimum maintenance cost saran lined steel pipe brings you another important advantage: it is easily field fabricated. No intricate tools required, no waiting for special fabrication, no costly delays.** ***Saran lined steel pipe is manufactured by The Dow Chemical Company.***

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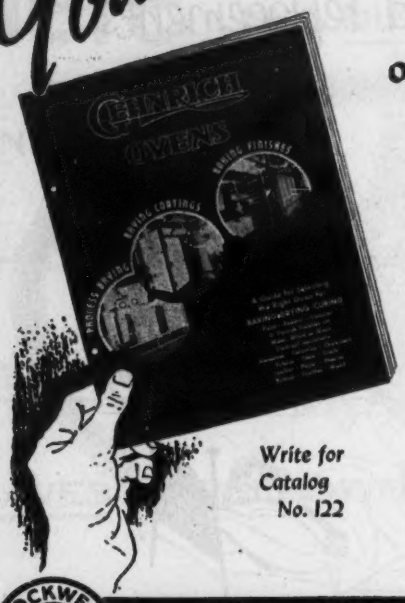
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Organic Finishes on
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and Electrical Insulations




This concise book presents the latest ideas on baking or drying in batch type or continuous ovens of various types by means of recirculating convection heating to assure uniformity of product and production speed. . . . Profusely illustrated with installation pictures and diagrams.

It will prove mighty helpful in sizing up your present or future heat processing requirements.

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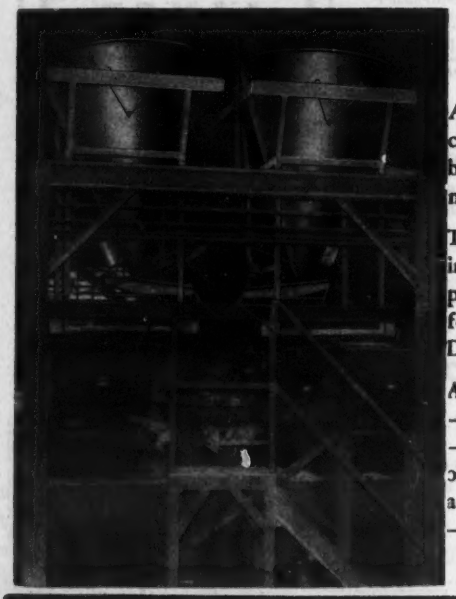
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W. S. ROCKWELL COMPANY
GEHNRICH OVEN DIVISION
220 Eliot Street • Fairfield, Conn.

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SYNTRON
DRY FEEDER MACHINES

*with vibrated, non-arching hoppers*



Are complete units for the controlled feeding of dry, bulk materials to processing machinery.

They can fill a definite place in YOUR material handling processes by controlling the feed of materials to Scales, Dryers, Mixers, Grinders, etc.

A fast flow — a dribble feed — or an instantaneous cutoff — controlled either manually or automatically — by scale action — or by motor load — or by solution flow.

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[illegible] Lexington Avenue — Homer City, Penna.

When inquiring check CP 6454 on handy form, pgs. 2-3


## NEW LITERATURE

### *Magnetic amplifiers explained in detail*

Eighteen-page booklet gives definition of magnetic amplifier terminology and includes complete explanation of theory of operation. Units are used in systems which require reliable static power amplification. Manufacturer claims that units have high ratio of power amplification to response time.

Curves, tables, and wiring diagrams are extensively used in various sections dealing with component parts, applications, as well as operating characteristics.

Booklet TD-52-600 is issued by Westinghouse Electric Corp., Dept. CP, Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 6455 on handy form, pages 2 and 3.

### *Tells why, whence, and how of sulfur filtration*

Filtering of molten sulfur as a means of increased production and lower costs is emphasized in 8-page, illustrated bulletin. In systems described, dirt is filtered out *before* it enters the burners, assuring a more uniformly clean supply of sulfur to the burners at all times.

Sources of sulfur impurities, volumes of impurities in "settled" sulfur, and variations in impurities (supplemented by several tables) are included as well as a brief history of sulfur filtration. Efficiency of method of sulfur filtration is illustrated by figures which were derived from a number of installations.

Installation features and twelve particular advantages including reduction of shutdown, corrosion reduction, and elimination of settling pits are also discussed.

Bul S-752 is issued by the Niagara Filter Corp., Department CP, 3080 Main Street, Buffalo 14, New York . . . . or for information check CP 6456 on handy form, pages 2 and 3.

### *Catalog lists crystals for industrial use*

Forty-five different crystals for use in laboratory and industrial equipment are described. Stabilized quartz crystals are of interest to development engineers.

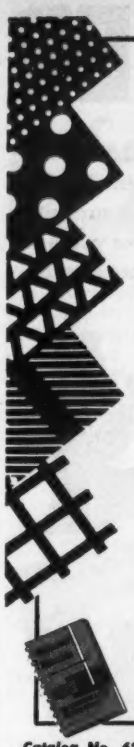
"Crystals for the Critical" is issued by James Knights Co., Dept. CP, Sandwich, Ill. When inquiring specify CP 6457 on handy form, pages 2 and 3.


Investigate the Advantages of H & K PERFORATIONS

— for cleaning, grading, straining and filtering — to meet stringent specifications for heat, corrosion, acid and alkalis resistance.

You have a wide selection of patterns from which to choose, all accurately perforated. Perforations may be had with a diameter tolerance as close as ± .0005". Materials include practically all metals and plastics.

Perforated sheets may be furnished rolled, formed, sheared, welded brazed or otherwise fabricated to your specifications.



*Catalog No. 62 tells the "hole" story —write for it!*

The Harrington & King PERFORATING Co

5636 Fillmore Street, Chicago 44, Illinois
114 Liberty Street, New York 6, N. Y.

When inquiring check CP 6458 on handy form, pgs. 2-3



DON'T BE HALF-SAFE

Obtain COMPLETE ELIMINATION

of Offensive Odors and Visible Smoke Plume

from your process by the new, low temperature CATALYTIC COMBUSTION PROCESS

Installations now cleaning up exhaust fumes from —

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When inquiring check CP 6459 on handy form, pgs. 2-3

## Chemicals in food

(*Continued from page 3*)

oxidants will greatly lengthen the life of edible fats and fat-containing foods. Sodium diacetate and sodium and calcium propionates protect bread against mold. Chlorine guards our water supply against disease-producing bacteria. Calcium salts in baked products and tomatoes contribute significant amounts of calcium, a mineral needed by the body. Similarly, ascorbic acid in fruit is the valuable vitamin C. Some chemicals such as vitamins $B_1$, $B_2$, niacin, and iron are used specifically for their nutritional value. The potassium iodide (goiter preventative) used in salt undoubtedly contributes to the nation's health. So the list runs, almost endlessly.

Reports of death or even health injury from foods are extremely rare in medical literature, and government seizure actions have been few and far between. The Elixer of Sulfanilamide incident occurrred in 1937 and was one of the dramatic events used to drum up fear of chemicals in food. At that time, Sulfanilamide had just appeared as a "wonder" drug and a manufacturer wanted to market it in liquid form. Apparently without making even a few limited tests, he dissolved the Sulfanilamide in diethylene glycol, a common anti-freeze for automobiles. Before the Food and Drug Administration could round up his product, the glycol had caused about 100 deaths.

Another often-cited case took place in the days of prohibition. Jamaica ginger, classified as a medicine, was exempt from the prohibition law. Hardened drinkers, however, found that they could steel themselves against its repulsive taste and used it to go on a bender. With typical enterprise, bootleggers whipped up a fake Jamaica ginger. To give their product a characteristic "bite," they used orthocresyl phosphate — a chemical which could and did cause a permanently-crippling leg paralysis.

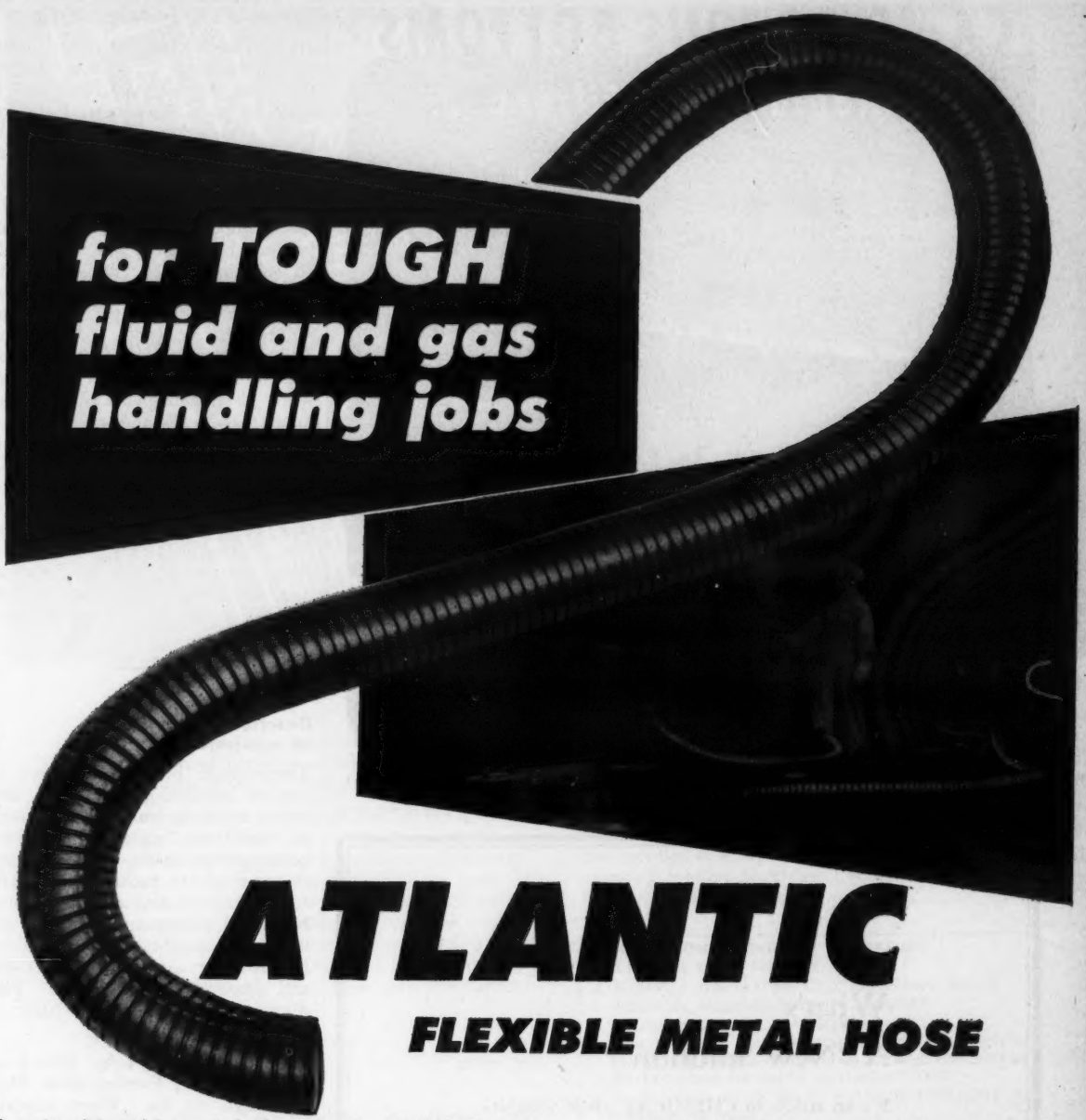
It is significant that these two incidents and other "headliners" are rare oddities: of the hundreds of chemicals that improve the food of millions of people, only an isolated few have caused trouble. They represent a tiny speck on the huge pattern of food technology.

Right after World War II, new chemicals poured from the nation's laboratories. By 1950, 704 chemicals were used or had been proposed for use in and on foods. Of this total, the Food and Drug Administration considered 428 to be definitely safe; but it felt that the other 276 had not been adequately tested. According to present law, the government is obliged to legally prove that a chemical used in a food is harmful. Although opinions differ as to ammending the current law, the 64-dollar question appears to be "When is a product safe for human consumption?"

Actually, it is not hard to show that a substance is a violent poison. Feed the questionable material to test animals; and if they die or show serious, harmful effects, one can safely assume that the substance is not fit for the human stomach.

Proving that a substance is safe, however, is quite a different matter. It depends on many factors, and any test can prove the safety of a product under only one set of conditions. If, for example, you feed dogs for one year and they show no ill effects, you still don't know what would happen in two years. If you feed them for two years, you can't be certain of the effect in five years, and so on. In the same way the amount of material you feed, how and when it is fed, the species of animal to which it is fed, the health and environment of those animals, and many, many other factors will affect your findings. Moreover, scientists know that the human system does not

(*Continued on next page*)


**Conveying nitric acid for use in batch nitrations is quick death for ordinary flexible metal hose. Sulphuric acid and plating solutions are other notorious killers. When temperature and pressure extremes and adverse handling conditions are also involved, hose replacement is frequent and expensive.**

**That's why—for tough jobs—it's good economy to specify Atlantic flexible metal process hose. Manufactured to survive the most destructive use, it is unequalled for leak-proof qualities, flexibility, durability, strength and lightness. It performs long after ordinary hose is scrapped and returns real savings in your material and labor dollar.**

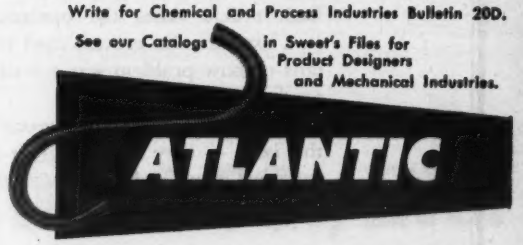
**Whatever your application — conveying, controlling movement and vibration, correcting misalignments, compensating for expansion and contraction — *there is an Atlantic flexible metal hose that is best for it.***

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***Our engineers have developed flexible metal hose for a number of classified nuclear applications. Though these types cannot be released at present, the experience gained is available for any unusual problems you may have.***

**Write for Chemical and Process Industries Bulletin 200.**

**See our Catalogs in Sweet's Files for Product Designers and Mechanical Industries.**

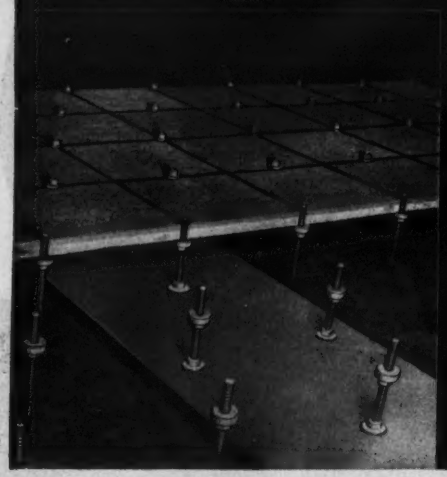



**ATLANTIC METAL HOSE CO., INC.**
**106 West 64th St., New York 23, N. Y.**

When inquiring check CP 6460 on handy form, pgs. 2-3

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WRITE FOR BULLETIN 12S12

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PROQUIP PROCESS EQUIPMENT

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When inquiring check CP 6461 on handy form, pgs. 2-3



## What's A "New Solution"?

**It's an article in CHEMICAL PROCESSING describing a new way of solving a tough plant operating problem. In each issue you will find specific "case histories" showing how these processing problems were solved. Each article states the operating problem . . . explains the process used and gives details of how problem was solved . . . shows results secured.**

**Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.**


(*Continued from preceding page*)

always respond like the animals tested in the laboratory. Add to this the fact that chemicals in food will be eaten by men, women, and children of all ages and in all states of health and one begins to grasp the proportions of our problem.

For all practical purposes, it is virtually impossible to prove that any product is perfectly harmless under all conditions. The decision whether or not a chemical is safe will always be a matter of judgement; and judgements do not always agree. Authorities must work with the conviction that competent scientists, when given enough facts, can determine that a chemical is or is not safe for practical use in foods. They will never be certain in the scientific sense of the word: they cannot even prove that any food itself is perfectly safe under every conceivable condition. However, they can reach a sound decision based on 20th century knowledge, and that is what every consumer has a right to expect.

---

### *Describes 11 types of equipment*

Twelve-page bulletin describes variety of processing equipment. Individual sections deal with such items as autoclaves, agitator, assemblies, quick-opening doors, extractors, cookers, resin plants, package pilot plants, and package heating and cooling units. Numerous photographs illustrate features and specifications of products. Handy charts summarize dimensions and physical characteristics. Flow diagram of typical resin plant installation completes data.

Bul 2403 is issued by Blaw-Knox Co., Dept. CP, Farmers Bank Bldg., Pittsburgh 30, Pa. When inquiring specify CP 6462 on handy form, pages 2 and 3.

### *Pumps 1.1 to 16.5 gpm at 600 to 5000 psi*

Construction features of high pressure pumps are emphasized in sectional illustrations of six-page folder. Dimensions are tabulated for 1½, 2, and 2½" stroke models, which have capacity ratings of 1.1 to 16.5 gpm at pressures between 600 and 5000 psi. Direct drive and back-geared pumps may be used for processing, compressing, and hydraulic pressure-testing applications.

Bul 295 is issued by American-Marsh Pumps, Inc., Dept. CP, Battle Creek, Mich. When inquiring specify CP 6463 on handy form, pages 2 and 3.


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When inquiring check CP 6464 on handy form, pgs. 2-3



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GREENWICH, CONN.

When inquiring check CP 6465 on handy form, pgs. 2-3

## Convention & Exhibit Schedule

### 1952

*Nov.* 16-18. American Institute of Electrical Engineers, Technical Conference on Recording & Controlling Instruments, Benjamin Franklin Hotel, Philadelphia, Pa.

*Nov.* 17-19. National Paint, Varnish and Lacquer Association, Annual Convention, Palmer House, Chicago, Ill.

*Nov.* 20-22. Federation of Paint and Varnish Production Clubs, Annual Meeting, Palmer House, Chicago, Ill.

*Nov.* 25. Manufacturing Chemists' Association, Inc., Second Semi-Annual Meeting and Winter Conference.

*Dec.* 4-5. The Society of the Plastics Industry, Inc., Film, Sheeting & Coated Fabrics Division, Fourth Conference, Commodore Hotel, New York, N. Y.

*Dec.* 7-10. American Institute of Chemical Engineers, Annual Meeting, Hotel Cleveland (headquarters) and Carter Hotel, Cleveland, Ohio.

### 1953

*Jan.* 19-22. Plant Maintenance Show, Public Auditorium, Cleveland, Ohio.

*Jan.* 21-23. Society of Plastics Engineers, Inc., Ninth Annual Technical Conference, Hotel Statler, Boston, Massachusetts.

*Feb.* 4-6. Western Computer Conference, First Meeting, Hotel Statler, Los Angeles, California.

*March* 8-11. American Institute of Chemical Engineers, Buena Vista Hotel, Biloxi, Miss.

*April* 26-29. American Institute of Chemical Engineers, Royal York Hotel, Toronto, Canada (Joint Meeting with the Chemical Institute of Canada.)

*May* 9-15. The Society of the Plastics Industry, Inc., Annual Meeting & Conference, Cruise to Bermuda.

*Sept.* 13-16. American Institute of Chemical Engineers, Fairmont & Mark Hopkins Hotels, San Francisco, California.

*Dec.* 13-16. American Institute of Chemical Engineers, Annual Meeting, Hotel Jefferson, St. Louis, Missouri.

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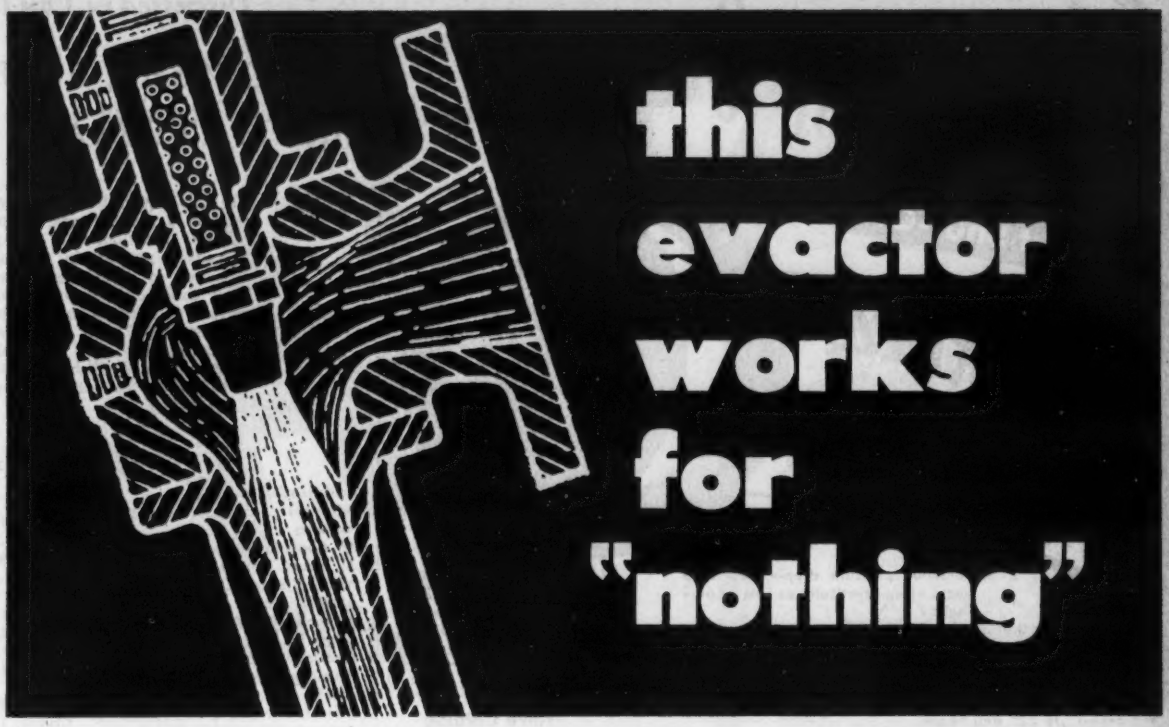
***Electrical equipment for chemical processing***

Fifteen-page booklet describes electrical equipment for chemical processing with emphasis upon standout characteristics and advantages of each unit to chemical processing industry.

Three types of equipment are featured—power generation, distribution, and utilization. Power centers, rectifiers, chemical motors and controls, and adjustable speed drives are outlined.

Circuit diagrams, ratings, and installation pictures are included where helpful. Booklet B-5656 is issued by Westinghouse Electric Corp., Dept. CP, Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 6466 on handy form, pages 2 and 3.

ESTABLISHING THE SAFE MINIMUM FLOW
OF CENTRIFUGAL PUMPS
in the
Processing and Engineering Data Section
on page 190




By that we mean, of course, that Croll-Reynolds Evactors achieve vacuums up to a few microns absolute pressure, close to "nothing".

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Croll-Reynolds supplies Evactors in 1, 2, 3, 4 and 5-stage units, operating in the following pressure ranges:

| | |
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| 1-stage | 3 inches of mercury absolute or higher |
| 2-stage | 0.5 to 4 inches of mercury absolute |
| 3-stage | 2 to 12 millimeters of mercury absolute |
| 4-stage | 0.15 to 3 millimeters of mercury absolute |
| 5-stage | down to a few microns |

The one and two stage units are used primarily to remove non-condensables, in priming and in vapor removal. Three-stage Evactors find application in the growing field of vacuum refrigeration, and in the chemical, food and petroleum industries. Four and five-stage units meet demanding vacuum requirements in many fields.

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**INFORMATION NEEDED FOR QUOTATIONS**

1. MINIMUM STEAM PRESSURE.
2. MAXIMUM TEMPERATURE OF CONDENSING WATER.
3. MINIMUM ABSOLUTE PRESSURE REQUIRED.
4. MAXIMUM DISCHARGE PRESSURE.
5. TYPE OF LOAD; THIS TO INCLUDE MOLECULAR WEIGHT OF GAS OR VAPORS OTHER THAN AIR AND PERCENTAGE OF EACH GAS OR VAPOR MAKING UP LOAD.
6. AMOUNT OF LOAD TO BE HANDLED PREFERABLY IN POUNDS PER HOUR.
7. TEMPERATURE OF LOAD.
8. TYPE OF CONDENSER DESIRED; BAROMETRIC OR SURFACE TYPE.
9. SPECIAL MATERIALS OF CONSTRUCTION NEEDED.

All of the above information is important for any EVACTOR with intercooler, precooler or aftercooler. Items 1, 3, 4, 5, 6, 7 and 9 are important for single stage and other non-condensing EVACTORS. Blank inquiry sheets are available on request, also literature.

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When inquiring check CP 6467 on handy form, pgs. 2-3

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*Discussed in This Issue - - -*

# PROCESSES, EQUIPMENT and MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to pgs. 2-3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.


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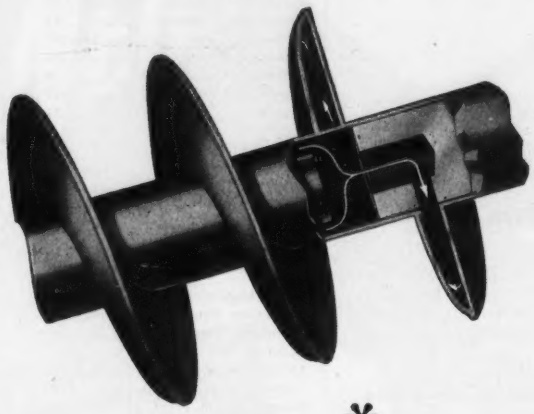
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*Get the complete story on* HOLO-FLITE *savings and how this new advancement can simplify your processing operations. It is backed by the same organization that pioneered* COTTRELL *Precipitators and* MULTICLONE *Collectors—your assurance of complete dependability.*

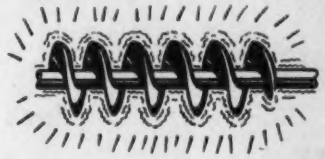



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*Reg. T.M.

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Dependable under extremely corrosive conditions . . . under many pressures, concentrations and temperatures . . . lead is the ideal material for handling sulphuric, sulphurous and chromic acids. In the chemical, textile, petroleum and metallurgical industries . . . wherever reliable control of strongly corrosive harsh-acting materials is imperative, lead can be used safely.

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*Simplex Model 100 S.* $143.00

*Duplex Model 100 D.* $188.00

*Motor price additional*

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0-12 GPH
Pressures to 300 PSI

**NEPTUNE PUMP MFG. CO.**
4912 North 6th Street • Philadelphia 20, Pa.

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**Solve Maintenance**

**CORROSION PROBLEMS**

**With**

**PERMANITE CEMENT**

Makes an excellent corrosion-proof mortar, resistant to acids, alkalies, solvents, oil, grease, water and steam.

It is ideal for corrosive service in brick floors and masonry linings in sumps, sewers and tanks. Permanite Cement is safe to handle and safe to store.

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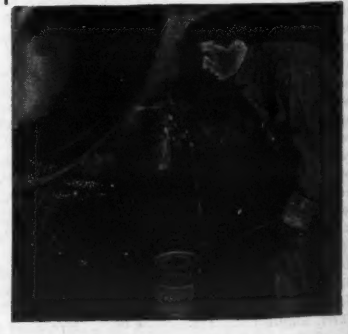
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Pyroflex Lacquer may be applied by brush or spray. No primer coat is required. It protects metal, concrete, wood or painted surfaces. Available in black, white and colored.

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**MAURICE A. KNIGHT**
411 Kelly Ave., Akron 9, Ohio
Acid and Alkali-proof Chemical Equipment

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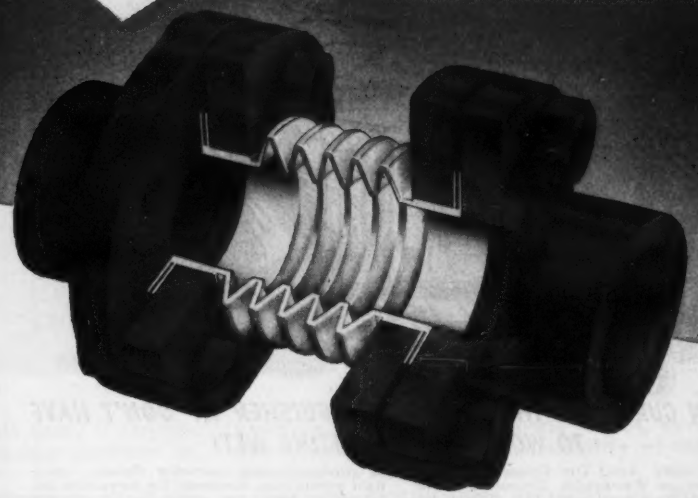
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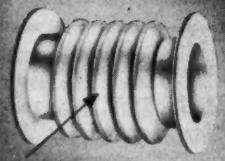
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NEW...TEFLON* BELLOWS CONNECTOR



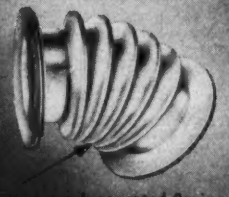
- CORROSION RESISTANT
- HEAT RESISTANT
- ELECTRICALLY NON-CONDUCTIVE
- FLEXIBLE EVEN AT MINUS 94° F.
- AS STRONG AT 482° F. AS AT 70° F.
- NON-ABSORBENT



Maximum expansion and contraction provided.



French-type gasket provides easy installation.



Flexible—stands repeated flexing without damage.

## The answer to difficult piping problems in your plant

Here is the new "JOHN CRANE" Teflon Bellows Type Connector which will solve many problems in the chemical industry. Fabricated of chemically inert Teflon, it economically serves as a vibration dampener as well as an expansion joint—connects misaligned couplings. The unusual properties of Teflon allow the expansion joint to be flexed repeatedly without damage.

End flanges of the joint are actually French-type envelope gaskets made integral with the joint for simple assembly between companion flanges . . . insures a tight, leak-proof seal on installations. John Crane Bellows Connectors are made to your specifications in a wide range of sizes to fit your particular needs.

Consult with "JOHN CRANE" engineers now on the uses of remarkable new Teflon in effectively handling corrosive liquids and gases.



***Write Dept. CP11 for informative catalog on Teflon and its applications.***

*DuPont Trade-mark for tetrafluoroethylene resin.

JOHN CRANE

**CRANE PACKING COMPANY**

1821 CUYLER AVENUE • CHICAGO 13, ILLINOIS

Offices in All Principal Cities in United States and Canada

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**LISTEN CURLEY... THAT'S ONE EXTINGUISHER YA' DON'T HAVE TO WORRY ABOUT GETTING WET!**

That's right! Ansul Dry Chemical Fire Extinguishers are Water-tight. Thousands of Ansul Extinguishers stand guard over difficult fire hazards in locations where the extinguisher cannot be protected from the weather.

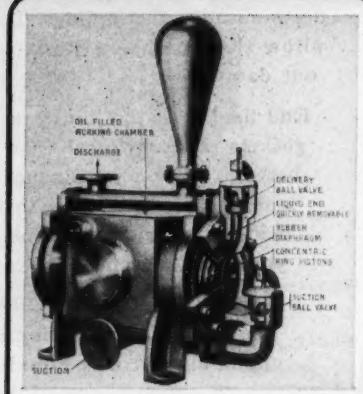
For installations where extinguishers cannot be pampered with expensive shelters, water-tight construction is essential for dependable fire protection. That's one reason you see so many more Ansul Dry Chemical Fire Extinguishers in outdoor locations protecting all sorts of tough hazards associated with the petroleum industry.

SEE PAGE 129

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**Your Best Bet for Those Tough-to-Pump Materials**

- ✓ POSITIVE DOUBLE ACTING
- ✓ NO PACKINGS • NO LEAKAGE
- ✓ NO CONTACT BETWEEN FLUID HANDLED AND WORKING PARTS
- ✓ EASY TO CLEAN
- ✓ LOW COST MAINTENANCE
- ✓ MADE OF ANY MATERIAL
- ✓ AMPLE PRESSURE




*Details of one liquid end. Mechanical parts are completely separated from the fluid handled by rubber diaphragms.*

Here's the ideal pump for corrosive, abrasive, viscous, thick, heavy, delicate or hazardous materials or fluids which clog or build up on pump parts. Economical—low maintenance—truly the pump that "can take it."

**Write for Bulletin 126**

**Shriver Diaphragm Pumps**

T. SHRIVER & COMPANY, Inc., 846 Hamilton Street, Harrison, N. J.

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about PUMP BASIC FACTS




*Learn* BASIC FACTS BEFORE DECIDING ON TYPE OF PUMP

BULLETIN S-146 AVAILABLE

Fault-filled enthusiasms for certain types of pumps now running rampant in industry, are dangerous. Because a *type* of pump performs sensationally on somebody else's job, it isn't necessarily certified for your use.

The unbiased, basic facts concerning types of pumps are contained in our special Bulletin S-146. Big illustrations and brief descriptions deal with the capacities and adaptability of such types as piston, plunger, rotary and centrifugal pumps. • Please use your business stationery when writing for BULLETIN S-146.

TABER PUMP CO. *(Est. 1859)*
320 Elm St., Buffalo 3, N. Y.

TABER PUMPS
HIGHER PRACTICAL PERFORMANCE

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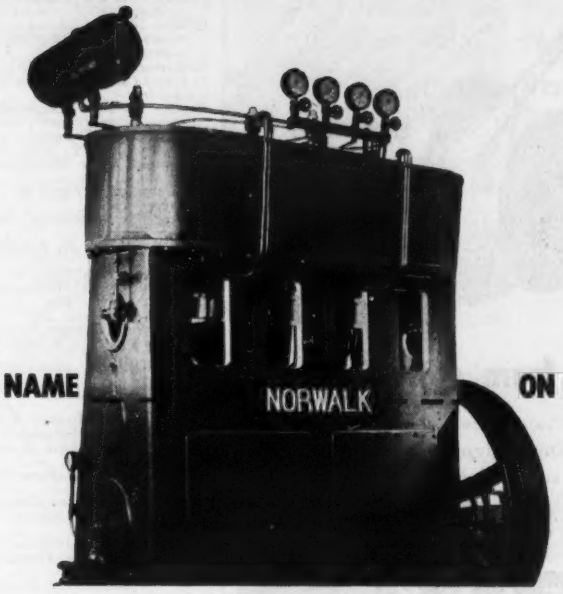
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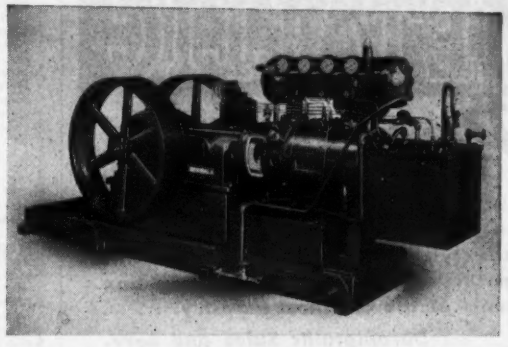
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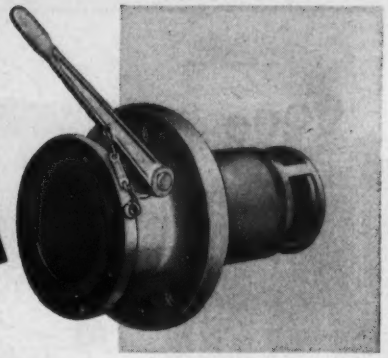
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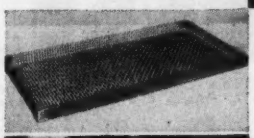
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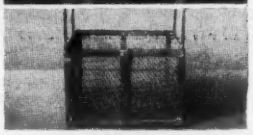
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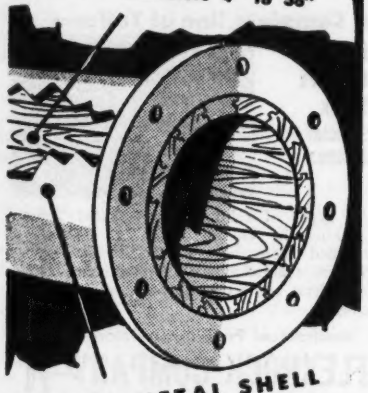
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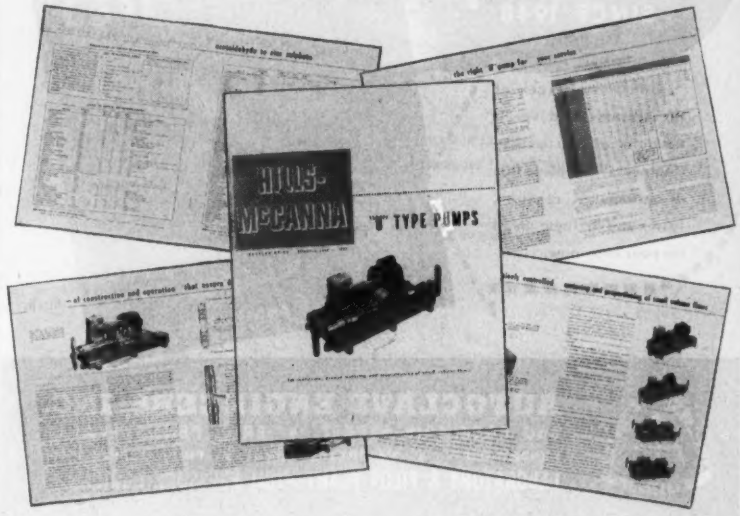
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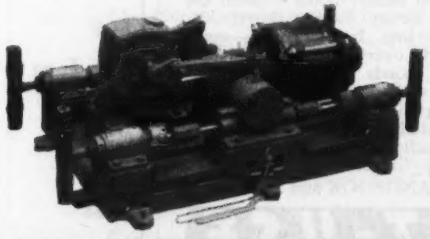


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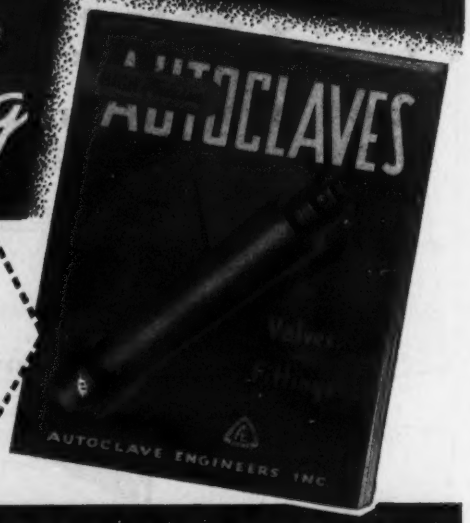
*Hills-McCanna "U" Type Pumps are reciprocating, variable stroke, mechanical drive units with maximum capacities ranging from 0.10 to 24 gph. per feed. One, two, three and four feed assemblies are available. Operating pressures up to 5,000 psi. A four feed unit is shown at the left.*

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## "That's Interesting"

### Solid sound

In studies being made on the information-bearing characteristics of speech, Bell Laboratories, 463 West St., New York 14, N.Y., is using plaster of paris models to represent the three dimensions of time, frequency, and energy of sound. The resulting spatial representation is termed "solid sound." The models look similar to a series of cliffs with sharp rises and depressions. The scientists at Bell Laboratories indicate that the significant fact derived from studying solid sound models is the individuality of the principal ranges for sound, and the similarity of these ranges for any given sound regardless of the speaker.

### Diamonds are still expensive

Some 50 years ago a French chemist (Henri Moissan) and Nobel prize winner in 1906, subjected the pure carbon form of sugar charcoal to 4000 degrees of heat with 100 tons of pressure per square inch. The finished product was a genuine diamond made from sugar.

### Melting metals in space

The continuing search for purer metals is currently utilizing a method of melting and refining metals by suspending them in a strong electromagnetic field. The process is called levitation or float melting and is intended to avoid the contamination incident to heating in a container. High-temperature metals are heated by induction and the impurities are boiled off. The spherical metal specimen actually floats in space, supported by the electromagnetic field, and gradually assumes the shape of a top as it passes to a liquid state.

Metals such as aluminum, tin, silver, titanium, and molybdenum have been levitated in solid state, either in air or in vacuo. According to the *Westinghouse Engineer*, this method was recently used to levitate approximately 75 gm of molten aluminum in vacuum for several minutes.

### Resin added to synthetic rubber improves properties

Users of synthetic rubber are mixing a potion these days that's reported to yield better and longer service in their products. The inclusion of Durez resins is said to improve hardness, stiffness, resistance to abrasion, as well as to raise the heat and chemical resistance of the finished product. Oil seals are typical items which benefit from this improvement. As reported in *Durez Plastics News*, the use of this resin increases the oil resistance and prolongs the wearing qualities of the seals.

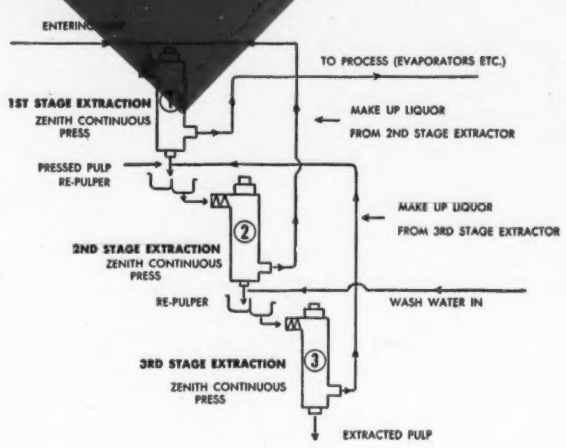
### Concrete slab floats on water

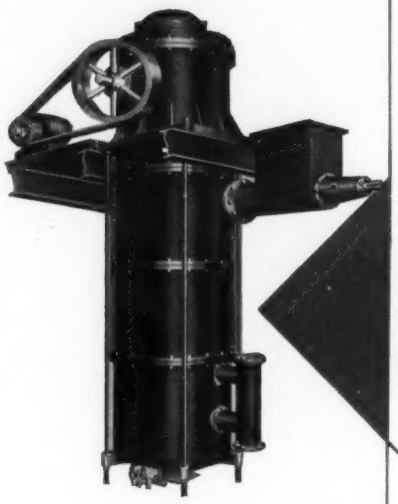
A waterproofing powder has been devolped which will enable concrete and plaster slabs to float on water indefinitely. According to *U. S. I. Chemical News*, the powder added to the mix will prevent capillary action of moisture in hardened cement.

### Gravity aids nickel mining

The force of gravity is being put to work by engineers of The International Nickel Company of Canada, Ltd, to induce huge clods of nickel ore to cave and crumble of their own weight. Method came about when engineers observed that low grade ore tended to subside and break up after higher grade ore was mined out. As reported in *Dun's Review*, this "induced caving" method makes it economically feasible to recover more lower grade ore than has ever before been worked in underground mining.


# multiple stage extraction system



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**Corn Starch Plants:** dewatering germ and fiber

**Canneries:** vegetable and fruit juice extraction, dewatering by-products

**Rayon and Cellophane:** for the continuous production of alkali-cellulose in rayon, cellophane, C.M.C., etc. by the slurry system

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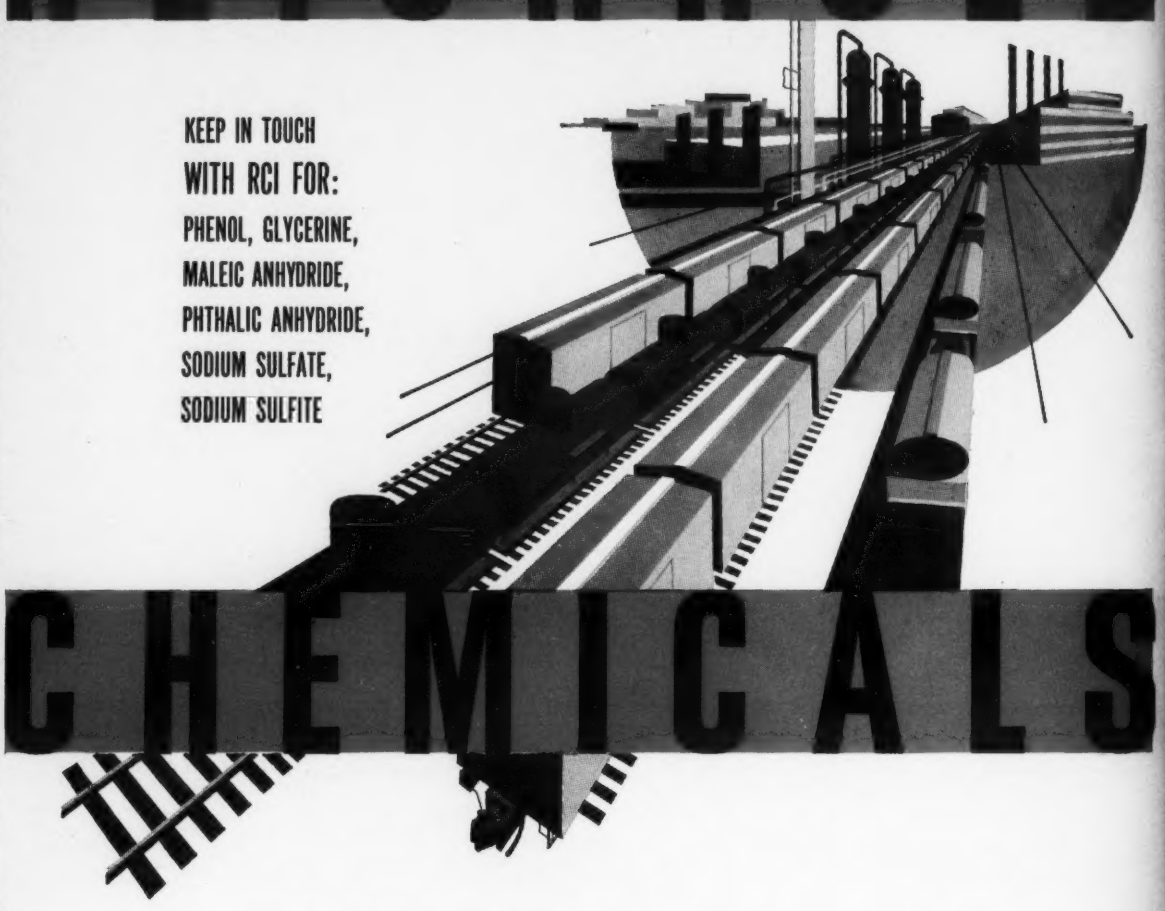
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